**The Fight for Survival: People's Action for Environment** is a compilation of the papers presented at a seminar on Environment and People's Subsistence, organised by the Centre for Science and Environment in November 1986.

From dams to mining, nuclear power plants to threatened tribals, and covering the larger questions of what kind of development is really appropriate and sustainable, the book is one about causes, campaigns and human endeavour—some on-going, some successful, and some irretrievably lost. It centres around two main themes:

— What are the vital issues at stake today, determining the survival of millions worldwide?

— How have people organised themselves to cope with this challenge?

It is a guide for action to save the environment.

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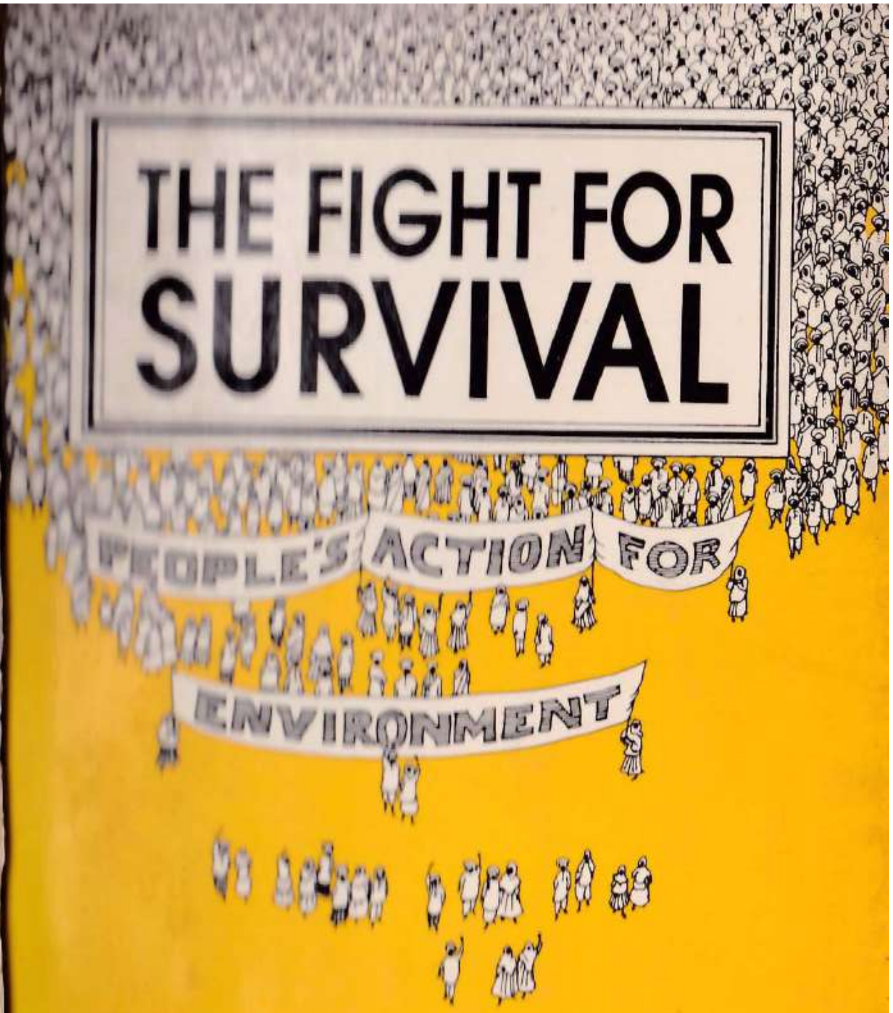
THE FIGHT FOR SURVIVAL

CSE

# THE FIGHT FOR SURVIVAL



CENTRE FOR SCIENCE AND ENVIRONMENT

# The Fight for Survival
## People's Action for Environment

*Edited by*
Anil Agarwal
Darryl D'Monte
Ujwala Samarth

Centre for Science & Environment
New Delhi

**TO THE FUTURE GENERATIONS**

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# Preface

The environmental movement began in the West. But over the last decade, it has spread far and wide in the so-called Third World. It has already taken deep roots in India.

The main purpose of this book is to bring to the reader an idea of the nature of the struggles being waged by individuals and voluntary groups across the world, and especially in India, to protect the environment. The opportunity for the authors of this book to come together was provided by a meeting of the board of directors of the Nairobi-based Environment Liaison Centre (ELC) which was held in New Delhi in November, 1987. ELC is probably the only global network of non-governmental organisations (NGOs) dealing with the subject of environment, in which groups from the South play an active and dominant role.

ELC was formed and set up soon after the United Nations set up its own environment programme in Nairobi, namely, the United Nations Environment Programme (UNEP). In its earlier years, ELC's main effort was to bring about greater networking between NGOs from the North and the South and between environmental NGOs and UNEP. In recent years, however, as environmental consciousness has grown rapidly within the South, ELC has begun to pay greater attention to programmes which aim to increase cooperation between NGOs of the South.

In pursuance of this objective, ELC's board of directors which has never met outside Nairobi and Geneva, decided to hold a meeting in New Delhi. The meeting was sponsored and hosted by the Centre for Science and Environment (CSE) and, taking advantage of the occasion, it was decided that the meeting should be followed by a seminar with a group of select Indian environmentalists. CSE felt that the best achievement of India's environmental movement and in a way its major contribution to the world environment movement, is its clear understanding of the relationship of the people, and especially the poor, with their environment.

Therefore, a simple title—Environment and People's Subsistence—was chosen for the seminar, and mainly those environmentalists were invited who had extensive grassroots experience. The seminar was not structured to discuss erudite and intricate theoretical aspects of the subject, which nonetheless emerged in substantial measure during discussions. Rather, it was left open-ended to allow participants to describe and share their experiences in fighting deforestation, pollution, environmental destruction and human displacement caused by large dams, overfishing, environmental illiteracy, occupational health and bad natural resources management, as a kind of international college of co-fighters.

The discussions would begin early morning and end only past midnight. On occasion, they were marked with hope and clarity and, on others, by frustration and confusion but all through by grit, by determination and, above all, by a deep and sincere yearning for change. That the existing practices of managing India's natural resources must change, also came out strongly from the presentations made by the three representatives of the Government of India who shared in detail various aspects of their work.

The meeting brought out clearly the need for a national debate in countries like India on an alternative process of economic and social development, which is both just and sustainable. The presentations repeatedly underlined the fact that environmental destruction invariably affects poor people and, thus, environmental mismanagement is always accompanied with social injustice.

Many people write to CSE asking "what can I do to protect the environment?" We hope the experiences presented in this book will help and inspire them both to answer this question and to join the effort to meet the century's biggest global, and for us Indians, the biggest national challenge. There is no bigger issue for *Satyagraha* (assertion of the truth) than the protection and rational use of the environment—a challenge that can only grow with time and must ultimately confront all.

CSE is extremely grateful to UNEP, EZE, NORAD, and the Dutch Government for supporting the travel of the participants, and to NORAD, in addition, for supporting the organisational costs of the seminar and this publication. We are also very grateful for all the encouragement and support given by Dr. Kamla Chowdhry of the National Wastelands Development Board and Mr. T.N. Seshan of the Department of Environment, Forests and Wildlife.

**Anil Agarwal**
**Darryl D'Monte**
**Ujwala Samarth**

# 'Green the people'

C.P. BHATT

It is really encouraging that all of us are assembled here to discuss the subject of environment and people's subsistence. I am really looking forward to benefitting from all the people here who are dealing with various environmental problems, whether they relate to the destruction of forests, fisheries and the interests of poor fisherfolk or dams. I also hope to learn from the experience of people who have come from the five continents.

There has been a lot of discussion on various aspects of environmental concern in this country. Over the last ten years, groups like the CSE and the environment cell of the Gandhi Peace Foundation have collected a lot of factual information about these concerns and also have tried to present an integrated picture of these concerns. CSE has also prepared a report with the collaboration of people from various parts of the country as part of a people's movement. In fact, as a part of this movement, the CSE report has been translated into various Indian languages—in Hindi, Kannada and Tamil. All this is helping the common person to understand the growing concerns and the problems of the environment. I describe all this as part of a people's movement because the presentation of this kind of factual information has an impact on decisionmakers and the people themselves.

We are almost in the situation of the man who was sitting on a rock but did not know there is a snake under the rock. This effort helps to point out that there is a snake beneath us which could bite us at any time. The CSE report has been presented in a very factual manner and has been able to influence the Prime Minister to the extent that he invited CSE to make a presentation to his entire Council of Ministers on the state of India's environment and thereafter, suggested that the same presentation be made to all the Members of Parliament.

This is very important because when the Chipko movement was starting—a movement which not only aims at saving the forests but also aims at tackling people's problems—the people in this movement were very concerned how their concerns would be translated, transmitted and described to the people in power. It is very important in an appropriate way because it was then quite possible for the movement to have been totally crushed and then the issues raised would have been crushed as well.

But I would also like to warn that as a result of all these efforts going on to educate people at all levels including policy makers, the environment can very easily become a fashionable matter. If that happens, not only we in India but all over the world, have to beware that the real voice for environmental concerns could be lost.

The use of this word 'environment' often brings out various shades of meaning. The word is used to describe rivers, forests, mountains and so on, but very often human beings are missed out. Sometimes the word is also used to include bigger things like outer space. At one level, the understanding of the environment is very superficial but at another level it is also very deep. Everybody has now begun to talk about environment, including those governments and administrations which are responsible for its destruction and those multinational corporations which make use of the resources of the developing world for their own production and in the process destroy the environment.

Now the concern for environment is growing very rapidly and it is being voiced all over the world, in South America, Africa everywhere. On one hand, the human population is growing and on the other, the environment is being destroyed. But what people do not realise is that even more rapid than population growth is the rate at which the environment is being destroyed, which literally threatens the survival of humanity. Our sources of water are drying up, air is getting polluted and the topsoil is getting washed away because of which, in many areas the productivity of the soil is declining. Hundreds and thousands of people are being affected by floods, landslides and soil erosion. Not only are the people being affected but also many development projects are being affected by this environmental destruction.

This puts a big question mark on all our future progress. For our progress, our knowledge of science, of culture and of everything else has to be put to use. Science has been a source of support to people but because of the ways it is being used to exploit natural resources, it has also become a tool of destruction. It is raising a big question. Amongst natural resources, the maximum destruction has been of forests. Nobody can deny the use of forests for the basic minimum needs of the people. But in the name of economic development, forests are being destroyed left, right and centre. This has brought about a major crisis of firewood shortages and shortages of wood to make houses, fodder for animals and so on.

I understand that we now have not even a third of the forests left in the world and in our own country, the figures that are available to us show that only 11 per cent of the country's area has forests left. It is said that we use 130 million tonnes of firewood and many million tonnes of wood for building and various industrial uses. If the forests continue to be destroyed at this rate, we will face major problems. I do not know about other parts of the world but I can say very clearly that at least in the Third World and in our part of the world the government keeps saying that it is the poor people who are responsible for the destruction. In a mad race to earn revenue, the government is selling away our forests to the cities and to the international markets and while doing all this, they do not take into account either the legal rights nor the natural rights of the people who live within these forests and who use these forests, thus, creating serious problems of survival for the forest people.

In my country, 45 million to 50 million people live in the hills and in this region, the destruction of the forests not only affects basic needs but it literally affects every aspect of life—the productivity of crop lands, animals, the ecological balance, and water resources. I cannot say whether the government has become conscious or not but several groups working with people have become more and more conscious, and the Chipko Movement is one such group.

Similarly, there are groups in this country who are raising the question of dams and making people aware of the ill effects of these dams. We have the very good example of Silent Valley and here too it was a local group that led this campaign and got it stopped. It was the government which followed its lead. The problem of fisheries and the fisherfolk may not seem to be related with environment but the two are ultimately very closely linked and all these issues of survival, of subsistence and of environment are all linked to each other. All across western and southern India, fisheries are a very important source of protein and if production and the productivity of the fisheries decline, it is going to affect many millions of people.

The biggest problem is that we are thinking of development without realising that the human being is the focal point of development. If we look at the way 'development people' treat forests, we find that they never think in terms of human beings at the central point. The marginalised, last person remains in a state of tremendous suffocation because his or her voice is never listened to by anybody and the number of such people in the country is very, very large and it is very important that their voices are strengthened and brought forward. We cannot green the land unless we 'green' the people. Our basic attitude towards natural resources and environment has been one of exploitation and it is important for a group like ours to turn this attitude on its head and think more in terms ecological enrichment and conservation.

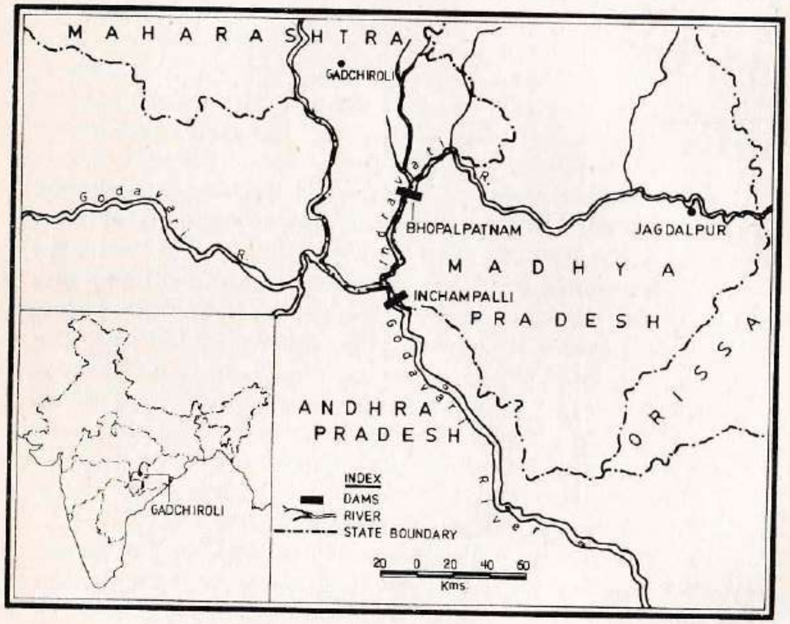
# Dammed rivers and damned tribals

### MOHAN HIRABAI HIRALAL

The two names of Bhopalpatnam and Inchampalli dams are largely symbolic. The area where these dams are going up is an area largely inhabited by the Gond tribals and is in the central part of India. To the south of this area is the Godavari river and in the upper reaches, there are a number of large and medium dams, now almost 24 in number. These are the 'welfare programmes' that the government is relying on. There is no point in providing details of how much electricity is going to be produced from the Bhopalpatnam and Inchampalli dams and how many villages are going to be affected. Just to provide a very broad idea of what these dams could do, it is enough to point out that some 75,000 tribals and 0.172 mha of forests will be affected.

The tribal people, sometimes called indigenous people, are dependent on forests for their survival. As soon as the government decided to start these two projects, making roads and selling trees to be cut, the local people realised that this was going to be an attack on their survival. This led to very widespread unhappiness. In 1984, for the first time, an effort was made to organise this discontent. Uptil then there had only been protests on an isolated level here and there. No attempt had been made to bring together all the discontented people of the region. A big demonstration took place on April 9, 1984, bringing together a number of activists in the area. The protest movement got the support of all the political parties as well as environmentalists like Sunderlal Bahuguna, who attended the meeting.

BHOPALPATNAM — INCHAMPALLI DAMS



This meeting decided that the proposed dams were in no way good for the people living in the area and did not represent development. They would in fact not only destroy the forests and the environment but also completely uproot the local people. It was resolved by everybody present that if any attempt was made to cut down trees to build the dams, they would launch a Chipko movement and stop the trees from being cut. And if any machinery was brought into the area, they would stop the machines by making human chains.

It was also pointed out that there is a Forest Conservation Act passed in 1980 under which no forest land can be transferred for non-forest purposes without the prior permission of the central government. The organisers of the movement were able to tell the people that the Maharashtra government had not taken permission or even asked for permission under this act from the central government for any of the dams that were being built in the area and for which work had started. It was demanded that as the state government had violated a central law, there should be a legal case instituted against it and its officials punished.

As a result of the demonstration and all the thinking that has been going on about environment and development, work on the two dams in the area has been stopped. The central government has sent a circular to heads of departments in the state that if any trees are cut without permission, money will be deducted from the salaries of local officials. Since then cutting of trees has also stopped. It might also be a strategy on the part of the government that when there is anger building up in an area, it is best to stop work to diffuse that anger. People will not protest for very long and after some time, work can be started again.

The government has, at the same time, stopped all development work in the area, and it is saying that if you want to protect the environment, how will you get development? Even if you want electricity lines, some trees will have to be cut. This is a kind of pressure being brought on the people. On the other hand, there is the construction lobby which still wants the dams to go ahead. So this has become a big challenge to the movement. The action committee had many discussions and it was felt that the first phase of the movement, the protest phase, had been successful. But it must also go ahead with the second phase and demand the alternative it wants.

In one of the tribal villages called Dhanora, another big demonstration was held in May 1986 and it was said that not only should these dams be cancelled but two other demands should be conceded. Firstly, no trees should be cut for any commercial or industrial purpose for the next ten years. Secondly, genuine development programmes should be taken up by the government. It was pointed out that there is high unemployment in the region and employment can be created through planting of trees, caring and protecting them. There is a lot of barren forest land. It was also said that a study can be conducted in different states to find out whether there are enough trees on so-called forest land, and whether tree plantation could not be taken up even on these lands. In any afforestation programme, only those trees should be planted which directly benefit people. A number of small irrigation schemes could be taken up which would be suggested by the people and local communities, controlled and used by them. There should also be schemes for generating electricity on a small scale to meet the needs of local villagers, with each community consisting of five villages. All the money that was earmarked for the dam ought to be spent immediately on these programmes. The meeting stated, "Then only we will be convinced that the government is really interested in the development of the people." This would be the most humane way to progress. The starting point would be the poorest people in the area and it will not affect their traditional lifestyles. In a letter we wrote to the Prime Minister in May 1986, it was pointed out that we were not opposing development. But what we are definitely opposed to is the manner in which our natural resources are being destroyed in the name of development.

This stand, which is today largely taken by activists and their leaders, has to reach the grassroots. Although the people do recognise this truth from their own experience, it has not been perceived by the community. It is, therefore, important that there should be greater education of activists in the region who can then take this thinking to the people. It will then make a more effective organisation of people's power. The demand for real development can even become the provocation for satyagraha, if needed. The current effort, until we reach a situation of direct confrontation when we have to launch a Chipko movement to protect the trees and to stop machines from coming into the area, is to educate people's organisations in this more fundamental manner.

## Bhopalpattanam Hydel Project

| | |
|---|---|
| **Location** | |
| State | : Madhya Pradesh and Maharashtra |
| District | : Left flank of dam and power house in Bastar district of Madhya Pradesh and right flank in Chanda district of Maharashtra. |
| River | : Indravati |
| **Hydrology** | |
| Catchment area upto dam site | : 37,933.14 sq km |
| Madhya Pradesh | : 26,174.54 sq km |
| Orissa | : 7,226.1 sq km |
| Maharashtra | : 4,532.50 sq km |
| Average annual rainfall 1943 to 1976 | : 1,495.00 mm |
| **Reservoir data** | |
| Maximum water level | : 201.160 m |
| Full reservoir level (FRL) | : 200.254 m |
| Maximum flood water level | : 142.12 m |
| No. of villages affected | : Maharashtra 37<br>Madhya Pradesh 15 |
| No. of persons displaced | : Maharashtra 7669<br>Madhya Pradesh 1154 |
| Culturable area submerged at FRL for Bhopalpattanam | : Maharashtra 14,218 ha<br>: Madhya Pradesh N.A. |
| **Power** | |
| No. and size of units to be installed | : 8 units (conventional) of 125 mw and space provided for 3 units for 75 mw reversible. |
| Installed capacity | : 1000 mw |
| Continuous (firm) power | : 285 mw |
| **Estimated cost** | : Rs. 40,294 lakhs |
| Cost per kw of installed capacity | : Rs. 4029 |

## Inchampalli multipurpose hydroelectric project

### Area under submergence

| Category of Area | Area affected (ha) |
|---|---|
| **Forests** | |
| a) Reserved Forest | 11,299 |
| b) Protected Forest | 1,186 |
| c) Revenue Forest | 7,108 |
| | 19,593 |
| **Land** | |
| a) Culturable land | 11,887 |
| b) Other land not specified | 7,853 |
| | 19,740 |
| Total Area Affected | 39,333 |

**Adams**: Mohan described the alternatives that the community was proposing and I am wondering how the people organised themselves and came up with alternatives, and how did he deal with dissenting votes of people in the community who wanted the dams to go ahead, if there were any.

**Hiralal**: There are two types of people that we came across. One, people who are directly affected and for whom it is literally a matter of life and death. For example, these would be people within the submergence area; with them, the idea of alternatives emerges automatically. They clearly see the need for alternatives in terms of small dams, which can irrigate their lands, or they would think in terms of small percolation tanks—structures to hold water which will then percolate into the ground and increase the water level in the wells. If there is a big river flowing past their fields, they often consider lift irrigation—pumping water into their fields. The second group is also quite big—people who are going to benefit from the water that the dam is going to bring. The movement has been trying to set up a dialogue right from the beginning with those people. To convince the ordinary people in the area who are likely to benefit from the proposed dam, it is most helpful to bring to them the experiences of earlier dams in the area. There is a particular medium size project, which was built and a certain amount of land was going to be irrigated. Actually not even half has been irrigated, and the rest has remained unirrigated because of the high siltation that is taking place in the dam. What is more, one area is irrigated first, then another—there is never enough water to irrigate all the land at the same time. The people who have been displaced by this dam, have not been rehabilitated even today.

The other thing we keep telling the people is that we have assessments of big dams which have satisfied the cost-benefit ratio (what they will contribute to the welfare of the people), but these dams do not belong to that category. And it is hardly sensible to spend so much public money without doing an assessment. We also say that if the cost-benefit ratio shows that the dam will be beneficial, then we are not against the dam, but the assessment must be done. The other thing we point out is that, on humanitarian grounds, we are not against progress. We want progress and development, but we cannot have progress for some people at the cost of other people. If you have progress for yourself, you must have progress for tribals also. There must be a way to find progress without uprooting the tribals, and at the same time benefitting us.

**Bhatt** : We all think about the people who are going to be within the submergence area, about the environment of that area, about the command area where the water will come in, and the people who will benefit. But do you consider involving people other than these two sets of people? For instance, when the Morvi dam in Gujarat burst, a very large number of people who were not even beneficiaries of the dam but were living downstream, were badly hit. Are you trying to involve people downstream at all? Whenever we talk about the destruction of the Himalayas, we point out that whatever happens in the Himalayas will have a major impact on all those living in the Indo-Gangetic plains. Thus, we try to involve people who are not directly adversaries or beneficiaries of the dam.

**Hiralal** : As far as accidents are concerned, this appeals more to the people within the command area, and sometimes they do come round to believe that the risk of accident is much more than the benefits they get. But as far as people who are outside the entire scope of the project are concerned, with them, the whole question of the development process and the kind of development we are following, raising those issues is more useful.

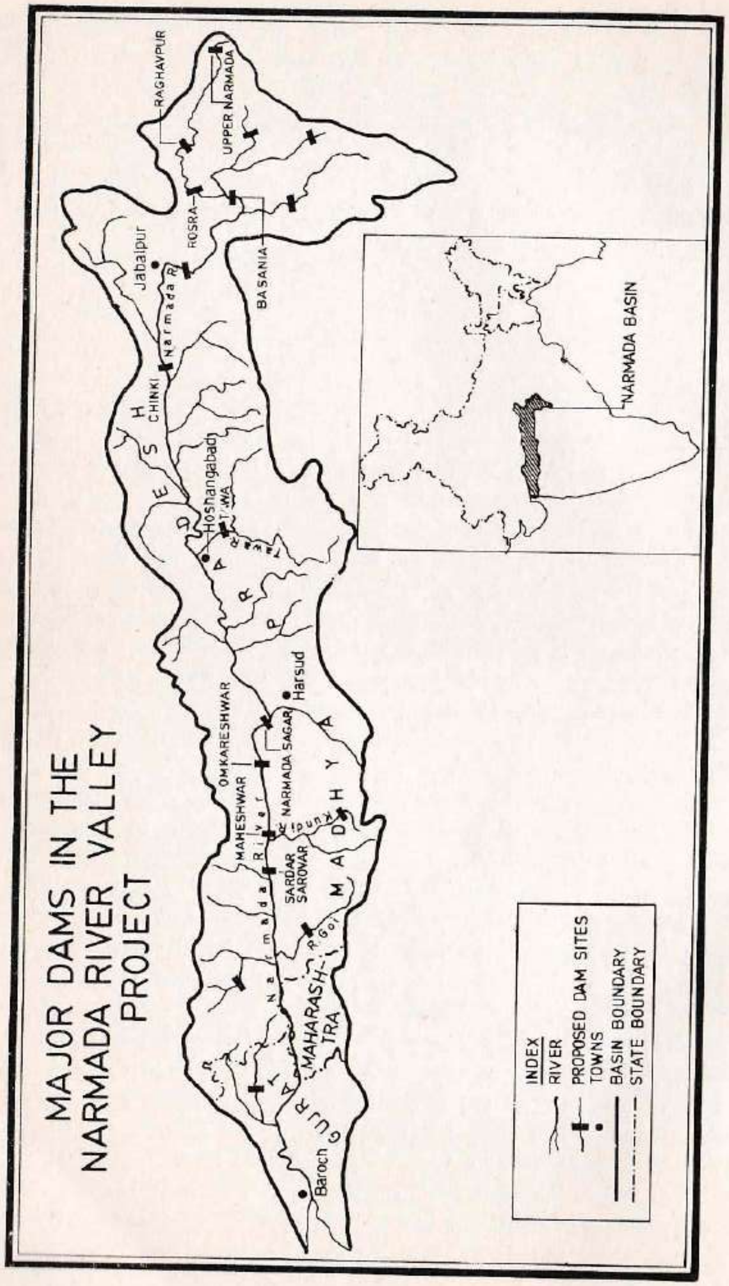
**Laba** : I think we have a very delicate situation where people are fighting against people. It is not any longer a question of fighting against the establishment, it is people versus people. Now in this negotiation that takes place between these two sets of rural people, are politicians involved? That is a very pertinent question because in the Indian context, when politicians are involved, then other issues get diluted. I would like to give an example from my state Manipur. We have a lake, which is one of the biggest lakes in the Northeast. And in the corner of the lake, there is a floating marsh called *phumdi*.

On *phumdi* we have the world's rarest deer called the sangai or brow-antlered deer (*cervus eldi eldi*). Every election time, politicians campaign and promise the people that they will finish these animals off, so that they can cultivate on the land which will be reclaimed. Now they have earmarked a total area of 40 sq km for a sanctuary and people went to the extent of burning this sanctuary in 1975, so much so that only 19 of these deer were left.

**Hiralal** : For politicians, Bhopalpatnam and Inchampalli have become a big issue because the project will almost completely wipe out the tribal community in the area, and therefore they have united on this issue. But, of course, on a number of smaller issues, both as individual and as small groups, they do have differences. But let me draw your attention to one example. In Gadchiroli district, there are three constituencies, and all three are reserved for candidates who are tribals. So there were three MLAs there, but one of them joined the anti-dam movement because the MP from the region was with it. All three MLAs come from the ruling party, but the other two MLAs, inspite of being tribals were consistently opposed to any opposition to the dam and were in favour of it being built. When the elections were held, the candidate who opposed the dam got elected, and those who were in favour of it, did not. The whole question of dams was made a political issue. Once the electorate becomes sensitised to the issue, it does exert pressure on its politicians.

**Sandbrook:** I want to comment on the point about people fighting against people. Some of the most difficult arguments, in my experience over the last 15 years, have been based around this very problem. When we were fighting the proposed third London airport, to be built over the top of Brent Geese, a particular type of goose, I vividly remember going to a hall and speaking about this venture. I left the hall very quickly, in fact, because I was hounded out by local citizens who said, how can you put our livelihoods at

risk when it comes to geese? There have recently been other serious clashes between people over seals, for example, in northern Scotland, and other species. From my experience, the only way out is that one has to be extremely assured in one's own conscience. From my point of view, the livelihood issue is in fact the issue—part of people's livelihoods involves a culture and an appreciation of species and varieties, and when that is understood, then these questions tend to melt away.



# Strangers in their homeland: The Narmada controversy

ANUPAM MISRA

The struggle in Gadchiroli over Bhopalapatnam and Inchampalli dams was a hard one. The struggle over Silent Valley was a relatively easy one. Now let me recount a somewhat tired and weary struggle over the dams on the Narmada.

The Narmada river is 312 km long, and the government is planning some 30 big, 300 medium and 3000 small dams on it. It is known as the country's largest river valley project. We often say that if the entire Madhya Pradesh irrigation department was gathered and its officers asked to put their heads together and write down the names of all the small dams they are planning, they will not be able to do it.

The area going to be affected by the Narmada dams is in Madhya Pradesh (MP), Maharashtra and Gujarat. Malwa and Nimad areas in MP are going to be particularly affected. Malwa is renowned as a hospitable and fertile area. Local wisdom has it that "you find *roti* and water at every step." I want to emphasise this because I want to make it clear that this was not a 'backward' region in any way, which was in desperate need of these dams and their 'progress'. History records at least 12 different empires and various civilisations which flourished here over the last 7,000 to 8,000 years. In its own way, it was a very developed region, and each ruler said that it was only by the grace of the goddess Narmada that they had achieved fulfillment.

But when the new surge of development came, primarily from the West, the advocates of this form of development — politicians and others — began to see the Narmada as a huge river that was letting its waters go waste into the sea! They did some calculations and figured out how many million litres of water was going waste, and they said that until this water was productively used, MP would not be able to progress. So the first thing they did, was to designate this region a 'backward' region, its people as 'backward' people, and its agriculture as 'backward'. And the remedy for all this backwardness was to build dams on the river.

The Narmada passes between Madhya Pradesh and Gujarat, and so there was competition between these two states as to who should build the higher dam. This started a conflict because a dam can be located in one place while its submergence region may be somewhere else. So an interstate conflict started. The argument went up to Prime Minister Indira Gandhi and when she could not settle it either, a tribunal was set up. This tribunal consisted of the Chief Ministers of the four states, bureaucrats, technocrats and social workers. Everyone put forward their own viewpoint. The tribunal worked out the sharing of the water and power and the costs and investment involved. But during this period, three governments came and went, both at the central and state levels and in each of the three governments, the person on the *kursi* would say that the Narmada project is good. All three governments were given the opportunity to pronounce judgement on the Narmada project. The tribunal's award was supported by the bulk of the national press. Work on all these aspects started in 1979, and then the World Bank also arrived to distribute its money. From 1979-83, work on the Narmada project went on almost unhindered.

But some of us could not understand the silence that surrounded the project, and wanted to know more. A small meeting of 15 to 20 people took place and we discussed the situation — how big was the gamble, how much land would be submerged, how many people would be ousted, what the benefits would be and whether anyone was monitoring this or if we needed to take up the job.

Apart from the newspapers in the state capital, we also reached out to friends in the small town press, all those who four years earlier had supported the Narmada project so thoroughly. We asked them whether they would allow space in their papers for a dissenting opinion, because it was primarily their local region which was at stake.

For the past one year, we have had a small team of ten to 12 people — some journalists and social workers — writing on various aspects of the Narmada project in Hindi and Gujarati, and most papers have published these articles, with the rider that while the tribunal's opinion was a technical one, it did not cover the environmental impact. We really do not understand how such a high-powered, supposedly well-informed tribunal, with so much money, could completely miss the environmental aspect.

We have visited some of the areas likely to be submerged and held a few small meetings and small organisations have been formed in some places. In each of our meetings, government officials have turned up, sometimes uninvited, and have tried to put forward their viewpoint. They have also started replying to our allegations in the press, but their tune has certainly changed. I can give two examples. One is a series of two articles written by the Narmada Valley Project Authority chief titled: *Let the people of Malwa decide if the dams should be built or not* and *Let the people of Malwa not turn down the Narmada project*. These articles, which they should have written 30 years back, are at least being written in 1986. So we feel that this terrible silence is being broken now.

I will not go into numerical details about the dams themselves. I do not even know whether because of the work that we all are doing, the dams will be stopped or not. But we believe that at least we will not allow the government to build the dams while lying to the people.

We also feel that the main struggle is not so much about the dams themselves. The struggle is much larger and it touches cultural and ideological spheres. We have to fight the 'multinational culture' that is pervading our country. As much as 75 per cent of agriculture in our country is dry farming, and this is subsistence agriculture on which people's lives depend. On the other hand, irrigated agriculture is agriculture to fill *pockets*, not *stomachs*. People are asked whether they want a dam (a sign of progress) or whether they want to 'remain backward'. They are not made aware of the socio-cultural and environmental effects that these dams could have. In this sense, asking the people to choose is senseless, because the people cannot make an informed choice. If, however, inspite of being fully aware of the ill-effects, the locals decide they still want the dam, the government should build it without further ado. But until the question is changed from a purely technological one to a cultural one also, some of us will be fighting to save trees in the dam region, some of us will be worried about the seismic faults, and the whole movement will be splintered.

Chandi Prasad Bhatt has mentioned that people are getting disheartened, they feel that they are losing. In this context, I would like to put before you two words rooted in Indian culture: *Jauhar* and *Gata*. *Jauhar* is the mass suicide performed by the wives of warriors who have lost a battle, by jumping into a fire collectively. *Gata* is found in all tribal areas. This is a small stone statue set up in memory of a tribal who had died in battle, and then for the whole year, all local fairs or *haats* take place around this statue. But society is so callous now, that for the two lakh people who will be drowned by this huge dam, there will be no *gata*. Whether there will be any *Jauhar* or not is another matter. We have been reduced to petitioning for compensation: "If not Rs. 50, then give us Rs. 25."

Neither MP nor Gujarat has received the green signal from the Centre for the Narmada project. But I feel we have lost because the whole struggle now hinges on one person and one department. I do not know how strong Environment Secretary, Mr. T.N. Seshan's shoulders are, but the whole struggle rests on them. If he is transferred tomorrow — and transfers happen very easily in India — then the whole Narmada issue will burst like a bubble and our efforts will come to nothing.

So we should not be fighting on one or two specific dam issues only, but we should be trying to understand how our society works, who runs society and what are the vested interests involved. If we do that, then maybe we will lose one or two dams, but we might win some other struggle.

The last thing I want to talk about is alternatives. I am always afraid of this because of this Western notion of development, which has filled the heads of our politicians. To fulfill their needs and dreams, their irrigated agriculture and electricity, *they* need the dams. But *we* are the ones asked to search for alternatives — alternatives that will provide this electricity and irrigation! I do not see why we should lose sleep over trying to find alternatives to help fulfill their dreams.

I want to recount a parable, a small, symbolic story about the time when the Janata Party came to power and there was much talk of simplicity in life. It was argued that the President should not live in such a large mansion. The President himself agreed that he should shift to a smaller house. But the people who looked for a new house for him, did so while assuming that he would shift along with his 3,000 orderlies, his 3,000 horses, his 25 guest rooms and all the rest. They searched and searched for a suitable house, but in the whole of the city of Delhi, they could not find an alternative house for the President and his massive retinue. So the President is still in the same mansion, even today.

We cannot look for alternatives without changing our ways.

**Choudhri**: There is a question I would like to raise. When the Narmada project came, they said two things: "We will provide so much irrigation, we will provide so much power." So I said: "There are alternatives." They replied: "Show us the alternatives." I said: "You spend so many crores just to plan this project, give me a crore to find the alternatives." But they did not. If there are alternatives, we will have to study them just like they have studied for so many years to find out the site where the dam could be built and so on. NGOs cannot provide alternatives; they can provide ideas. And we can provide answers at the 'test-tube' level or at the micro level, but this question is always fired at us: "Show us the alternatives".

Another fact regarding the Narmada project is that it is being built on a volcanic area. Sardar Sarovar is right on it. There is a fault in these rocks. But the government is not prepared to show NGOs geological data. So these are the handicaps that NGOs face. We know that there are alternatives, but in concrete terms we cannot state them because we just do not have the resources.

**Hiralal:** Banwarilalji is very right in saying that the bigger responsibility of finding alternatives to the current processes which are environmentally destructive and socially destructive is definitely on those who are responsible for the destruction — the establishment. But he says we can also play a role in looking for alternatives. Now one of the things that we are doing in our area is looking at schemes of the government itself, which are more appropriate. For example, in Maharashtra, there is the Employment Guarantee Scheme (EGS) which is unique in the country because it is supported by an Employment Guarantee Act. It is the only act where employment within 50 km is guaranteed by the state as a legal right of the citizen. The second is the government scheme to afforest denuded forest lands, that is, lands which are under the control of the forest departments, which are supposed to have forests, but do not have any trees on them. We are trying to use these government schemes themselves as a way of building up pressure on the government.

**C.P. Bhatt:** Although I have been to several seminars, it has not become clear what are the alternatives, and for whom. Should alternatives be designed by the people most directly affected or by organisations sensitive to their needs? Projects are never made keeping in mind those people who are within the submergence area of a dam. After all, it is not these people who are asking for the projects. They are not saying: "Come and set up these projects so that our homes can be destroyed and we can be thrown out." The projects are being built for those people who are going to get the electricity and who are going to benefit from it. So why should we look for alternatives? The planners should actually be looking for alternatives. In the normal process, when there is a need, an alternative or a solution is always found for it. For example, we used to have these grinding stones in the hills for grinding our grain and this took up a lot of human energy, and we found that water mills were a solution. In the plains we had to perform the same task, so we thought of electricity and made electric milling machines. Alternatives and solutions are always found by those people who need something. So it is really these people who need the electricity who should be finding alternatives.

**Ui:** This is surely a very difficult question and perhaps I have no fixed answer. But in some places, in my experience, alternatives are somehow invented by the most affected people. Things like garbage removal or sewage treatment are always a source of trouble in Japan. We need it somewhere, but people close to the site will oppose such a facility. But in some towns, this conflict became so controversial that the answer was to reduce refuse or not to discharge it at all. This was proposed by people near the plant site and other people finally had to follow the proposal. But this group decision was followed by local people trying out a technical process to reduce the amount of refuse. It showed some success so it was propagated for the whole city.

In the case of a night soil treatment plant which is always very dirty, I suggested that they refill it. Until there is no space for the present type of treatment plant, there will be no improvement. Then, someone will design a new plant. As long as we accept the present level of technology, things will not change. If we refuse to, there will be some improvement. And it really worked that way. In some cases we have spontaneous alternatives. And in some cases, we need more permanent solutions. We do not always need a sewage treatment plant.

I have some small and medium alternatives to the very large-scale, expensive and unreliable system of sewage treatment in Japan. To demonstrate this alternative clearly and visibly to local people was the answer, and they chose it. But in that event, we must make some calculations of cost — initial cost, maintenance costs and so on. We need some technology and some skills to bring out alternatives. In other cases, like irrigation, there are already alternatives.

**Agarwal:** I would like to make a few comments. First of all, on dams in India in particular. One must appreciate that these dams have affected a large number of tribal people specifically, because there has been a tremendous failure of tribal leadership. I have found that in most cases where the tribal leadership was active and opposed to the dam, it was halted. The case of Bhopalpatnam and Inchampalli is indeed a very good one. And it is not just tribal leadership, but where affected people have been involved in large numbers to oppose dams, those dams have run into trouble. The Bedthi dam in Karnataka is a good example where the people who were going to be affected strongly opposed the dam and got the dam stopped.

I recall talking to a tribal leader, who had about four or five years ago opposed a project which was to destroy much of the original *sal* forest. I asked him about a dam, "Why don't you oppose this dam? It will affect a lot of people in your own area." He replied: "How many development projects can I oppose? Everyone will say I am anti-development."

That, however, does raise another issue which I do not think we have touched adequately, which is the oppression of the aid agencies and the companies in the Western world who want to make money out of such projects. When aid agencies get into this business, in most other countries unlike India, there are very large companies who want those projects. Many of these projects are supported so that domestic companies can make a lot of money out of them.

Then there is the bigger issue of the concept of development. This is where I begin to understand why the tribal leadership is failing. The tribal leadership finds the concept of development so over-powering that it finds it difficult to oppose it at every step. And this indeed is a very serious issue. Let us not just talk about the tribal leadership. Everyone is told that dams are the only alternatives. The whole professional system keeps reiterating that. This view can be very powerful for any leadership. It becomes very difficult to challenge these views. And this does mean that people who are fighting for alternative development will themselves have to marshall an enormous amount of skills in science and technology to be able to oppose many of these arguments. Ultimately, the question with respect to dams is do we want the kind of water management that is promoted by these large dams or do we want some other form of water management?

What makes it even more difficult to promote alternatives is the secrecy that prevails — not just the secrecy surrounding projects, but the lack of geological data and water data and so on. How do we design an alternative to something which is being promoted and canvassed for by the agencies which know? In this country, it is almost impossible to get information. I remember talking to people in the US who regularly organise dam fighters' conferences and they were repeatedly saying that they were able to stop a dam, because they were able to show that there was an alternative system of water management which was socially and environmentally better. They could do all that because the data which was required to undertake all the planning and designing was available in public.

There are, thus, larger issues like the right to know, which are associated with this whole process. To my mind, one of the major solutions to this lies in that those who are affected, have to gain respect and an appreciation for their own cultures. Unless that pride in their culture emerges, this whole oppression caused by the single track development is going to continue in a very big way. And, therefore, the respect for the diversity of cultures becomes a very integral part of this whole concern for environment and people's subsistence needs.

My final comment is that dams are just a part, and a symbol, of the development process where essentially the more powerful in society, whether nationally or globally, are making use of the natural resources that exist in the world for their own purpose and in the process, dispossessing poor people. The tribal people are the most weak and powerless and it is just a part of the process which all powerless and weak people are facing everywhere in the world, whether you see it between communities or between nations. I cannot forget what a tribal opposing the Koel-Karo dams in Bihar said: "They have first taken away our forests, and now they want to take away our rivers and streams." That indeed is the actual process which is taking place. The fight against the Koel Karo dams is the oldest fight against a dam in India.

Note: The Narmada Project was cleared on April 13, 1987.

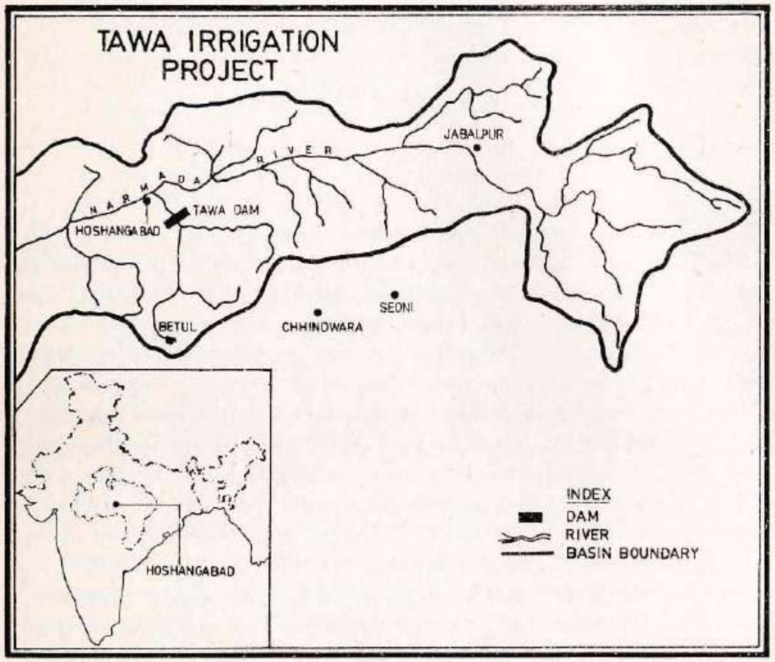
# Tawa: A harvest of water

BANWARILAL CHOUDHRI

The so-called 'modern' agriculture technology, the harbinger of of the Green Revolution, consists of hybrid seeds, high doses of chemical fertilisers and pesticides, and profuse irrigation. A wheat crop grown under this pattern needs six irrigations, requiring adequate arrangements to supply water. Proper irrigation to crops, under any system of agriculture, gives high yields. The planners of *Bharat* knew it and had made excellent irrigation arrangements from rivers, ponds and wells. The engineering skill of yore is still evident amongst the tribals. But India, not *Bharat*, is a *pichlagoo* country—a country that blindly follows those whom it thinks superior. India got enamoured by the Tennessee Valley Authority (TVA) and hurriedly started thinking in terms of large river valley projects. There was also a craze for having everything that was the biggest in Asia, if not in the world. India went on raising these so-called modern temples in the form of the Damodar Valley Project, Bhakra Nangal dams, and more recently, the Sardar Sarovar and Narmada Sagar projects. These dams have ultimately done more harm than good. In the long run, they are costly, uneconomic and unproductive, inhuman and ecologically damaging. The Tawa dam, a large dam situated in Hoshangabad district in Madhya Pradesh, is an example.

## Costly dam

Hoshangabad district has an area of 1.39 million hectares (mha). During 1965-66 the net sown area in the district was 0.4 mha and area irrigated from all sources was about 5000 ha, around 1.3 per cent of the net sown area (as against 8.1 per cent for tre state as a whole).



The Tawa Project envisages providing assured irrigation annually to 0.245 mha of culturable command area in the district, increasing thereby the area under irrigation from 1.3 per cent from all sources to 60 per cent from canals alone. This is a tall promise which has so far not been fulfilled.

The Comptroller and Auditor General of India reports: "On the basis of preliminary survey done in 1947 by the Central Water and Power Commission, an estimate for Rs. 13.95 crores was administratively approved by the state government in August 1956. Further investigations were carried out by the State Irrigation Department after 1956. Based on designs prepared by the Central Water and Power Commission, the project was technically cleared by the Planning Commission in August 1960, and administratively approved for Rs. 21.80 crores by the state government in December 1960. The estimates were revised to Rs. 34.14 crores (January 1966), Rs. 40.19 crores (April 1969), and Rs. 63.47 crores (in 1972 adopting the 1971 schedule of rates), taking into account the escalation in costs from time to time. Since the survey for about 0.12 mha of command area was not completed by 1971, the provisions for the canal system were made by adopting the cost curves (cusec mile basis), working out cost for a sample distributory and adopting it on culturable command area basis to the remaining systems. The estimates were last revised in 1977 to Rs. 91.42 crores, after providing for increase in quantities for various items of work based on final surveys and approved drawings, increase in cost of land acquisition, higher tender percentage, and escalation on cost of material and labour."

The total expenditure on the project will be about Rs. 300 crores, including expenditure on farm development, unnecessarily burdening the farmers (without their consent) with a debt of Rs. 200 crores or more, which is beyond their capacity to pay. The burden of this loan and a drop in the average crop yield has aggravated village poverty.

The Tawa Project is very costly. The original estimate was only Rs. 13 crores but actually the total cost is now Rs. 300 crores. With all the land-shaping bills, the total cost will probably be Rs. 1,000 crores. From Rs. 13 crores, the cost has gone up to Rs. 1,000 crores. This is a game commonly played. Whenever a dam project is submitted, it is claimed that it costs very little and its advantages are many. But actually nothing of the kind happens.

## Unnecessary dam

The soil of the Tawa command area is mostly heavy and highly water retentive. The total average annual rainfall of Hoshangabad district is about 61 inches (1525 mm), and even during drought years, average production of crops in the district is quite high.

According to the Auditor General of India: "The area under *kharif* irrigation from the project was negligible. Paddy was not being grown, high yielding *jowar*/maize and cotton envisaged in the cropping pattern were either grown in small areas or not grown at all as irrigated crops. During 1970-80 though, there was an apparent appreciable increase in the area under *rabi* irrigation. It was observed that in about 14,900 ha, out of the total *rabi* irrigated area of 22,500 ha, cultivators took water for *palewa* (preparing the land before sowing) during October 1979 and did not take water afterwards for irrigating the crops. The Chief Engineer, Tawa Project, reported (September 1980) that cultivators sowed crops not requiring irrigation in *kharif* amounting to 100 per cent of service area, in *rabi* amounting to 30 per cent, and no crops in summer. Thus, even six years after the introduction of irrigation from the Tawa distribution system, the command area still retains the characteristics of unirrigated cultivation, and cropping patterns had not changed except in the head reaches of the canal system where high yielding variety of wheat was grown. That this result was inevitable is evident from the scientific and technical opinion now available."

Tawa, instead of doing good, is a problem for everybody. When I raised this issue, Dr M.S. Swaminathan was the director-general of the Indian Council of Agricultural Research (ICAR). He appointed a one person commission to go into the details of the scheme. The commission reported several facts. One, there is already heavy rainfall in this area, 50 to 60 inches a year. Second, there is black cotton soil, so it retains water and does not need any irrigation in the *kharif* season. Later it was demonstrated that after the rains, people did not want irrigation from Tawa, except where there was drought or when it did not rain in October. That is an important month, because if there is no rain, we do not get good *rabi* crops, especially wheat.

Dr D.R. Bhumbla, deputy director general of ICAR in his report of March 1978 on the Tawa command area to the government, observed: "The project has been designed to irrigate about

45,000 ha of maize and *jowar*. It will be nearly impossible to retain the cropping pattern. Maize/*jowar* in this area will not need any irrigation during the *kharif* season, instead they will need drainage. The unirrigated *jowar* is already endangered because of the higher water table and waterlogging.

"The project has been designed to irrigate about 90,000 ha of paddy. This is a new crop in the area and I am of the opinion that this should be discouraged otherwise it will be nearly impossible to control water during the rainy season.

"It will be in the best interest of the project that the canal should be completely closed during the rainy season so that the drainage problems are not accentuated. Irrigation should be confined to the *rabi* crop only."

While generally agreeing with the observations of Dr Bhumbla, the Chief Engineer of the Tawa project reported in September 1980 to the State government: "In *kharif* season, Hoshangabad receives heavy rainfall and has heavy retentive black cotton soil. Under these circumstances irrigation development presents a very difficult problem. The margin of profit in conventional crops with and without irrigation is smaller. The use of irrigation water is mainly to rescue the crops in occasional drought years and long dry spells. During the rainy season ... soil moisture remains, many a time, a problem rather an asset ... Fields in *kharif* season are found to remain uncultivated due to this hazard ... when the fields remain fallow during *kharif* season, soil moisture depletion is poor and availability to subsequent *rabi* crops is sufficient and ensured. Thus, in a monocropped *rabi* system, irrigation demands remain limited and erratic. In the area, for a successful *rabi* irrigation to develop, double cropping of *kharif* and *rabi* to a large measure is obligatory otherwise development of irrigation in the *rabi* season shall also be poor. The application of irrigation in the area accentuates soil erosion and drainage problems during *kharif* season and may hold high moisture contents in the soil during sowing of *rabi* crop. The result could be disastrous."

These opinions of highly responsible government officers and the actual situation which has compelled the Tawa Ayacut authorities not to release the water in the canals before October 25, prove that the project was not necessary.

Summing up, the Auditor General states: "According to the scientific and technical opinion now available, because of the soil and weather conditions in the command area of the Tawa project, agricultural operations in both *kharif* and *rabi* seasons with the help of irrigation could not have been productive, but on the other hand, irrigation could be even harmful. The cultivators also resisted changing their habits and the cropping pattern they have been used to. Thus, it would appear that the project was ill-conceived and the benefits that were presumed would be available, could not have been realised. This would also indicate the need for a second look at the programme for development of the command area, so that possible further unnecessary and wasteful expenditure could be avoided."

### Unproductive project

Due to the nature of soil and climatic conditions in the Tawa command area, flood irrigation has lower level crop yields. The Auditor General's report compared the yields per acre under various crops after irrigation during 1977-78 and 1978-79 and the yields prior to introduction of irrigation in 1971-72 in Hoshangabad district.

**Table 1**
**Comparison of yields before and after irrigation**

| Crop | Average yields per acre (in quintals)<br>Before irrigation | After irrigation<br>1977-78 | 1978-79 |
|---|---|---|---|
| Paddy | 4.00 | 3.98 | 3.88 |
| Jowar | 2.82 | 3.64 | 2.74 |
| Maize | 4.81 | 4.07 | 4.01 |
| Wheat | 3.14 | 3.30 | 3.06 |
| Gram | 2.43 | 1.96 | 2.08 |

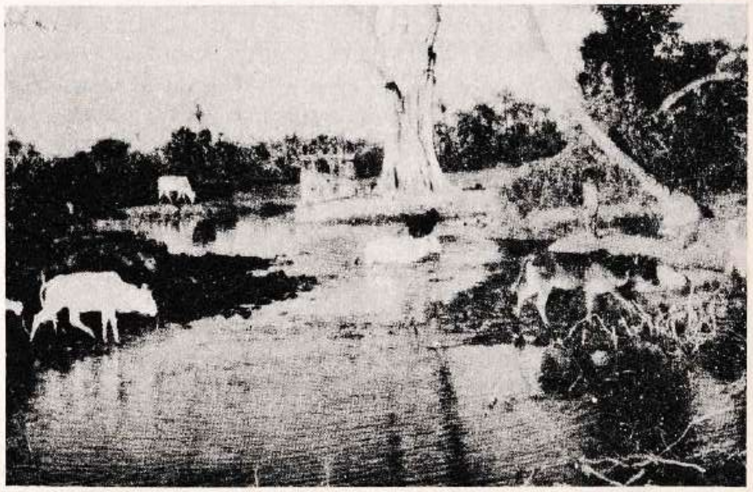
*Source:* Commissioner, Land Records.

After the Tawa dam, both total productivity and productivity per acre have declined. This is because of the constant availability of moisture in the soil. Wheat needs a dry period, it does not need constant water. The water table has gone up, so the productivity has gone down. The government itself has given these figures.

Previously, we were growing a different type of crop. We were growing lesser millets, larger millets, *tur*, and a few other such crops. With the coming of the dam, the soil characteristics have so changed that none of these crops can be grown. Now the crops are soybean, followed by wheat. Not a grain of soybean is used by the farmers. They feed the spoiled grain to the cattle, but they do not eat it themselves. The result is that before the project, they had their own *tur* pulses but now the price of *tur* is eight rupees a kilo, which is very high. We have made a study and found out that the people are suffering from malnutrition, especially children, because they are not getting what they really need.

### Inhuman and corrupt

One of the great problems of a major dam is the displacement of the population from the submerged area. The general tendency of the government is to pay as little compensation as possible and never in time. The population loses developed land and homes. They should get 'land for land' and the developmental expenses and material for house construction, with a sustenance allowance till they are rehabilitated. This is not done. The people usually displaced by dam projects are tribals. Being uneducated, neglected, poor and exploited, they cannot raise their voices against such injustice and inhuman treatment. They meekly surrender their property for a very low compensation in



**Waterlogging caused by the Tawa dam.** A. MISRA rupees, which they soon lose. Most of them become landless labourers or slum-dwellers in cities. Bureaucratic corruption in rehabilitation and payment of compensation is rampant.

When the Tawa project was built 8,000 ha were submerged and people from 20 villages were displaced. These were mostly tribals and nobody knows where they have gone. They are poor people, they have no means of resistance and they have been scattered all over.

But who will compensate the farmer for having lost his land? Take my own example — I had 4.8 ha of land, now 5 per cent of that is gone in land shaping and 1.6 ha are waterlogged. So I have only 2.96 ha left. But the government is charging me for all the work they have done on 4.8 ha! Because they have landshaped 4.8 ha, and the cost of landshaping is Rs. 1,000 for 2.5 ha, I have to pay Rs. 6,000 which I have not yet paid and probably will not. I want to know why I should not be compensated for those 1.6 ha of land that I have lost to waterlogging. I have written to the government and there has been no answer so far. I do not think that I will get one.

One of my friends had only 4 ha, and it was very fertile rice growing land; all of it is waterlogged. He does not even grow a grain of rice and there is no compensation. We are fighting his case, we are organising meetings in village after village, but nothing seems to happen. Sometimes I feel we have lost the battle; I do not know if we will win the war eventually.

### Soil degradation and loss of land

The total land area of the country is 305 mha, of which the area under agriculture is only 143 mha. Out of this, 6 mha are affected by waterlogging. The Tawa command area is also similarly affected. A random survey of the Gram Seva Samiti's *Mitti Bachao Abhiyan* (Village Service Committee's Save the Soil Campaign) revealed that 5 per cent of the command area is waterlogged and this is likely to go up to 25 per cent or even 33 per cent. It has been established in the Chambal area that waterlogging and salinity starts earlier in such soils and takes only ten years to cause the maximum damage. Dr Bhumbla has also confirmed this: "Even though irrigation was provided only two years back, a number of villages have been severely affected by waterlogging. In fact those areas which were most productive under unirrigated conditions, have been affected the most because of their low lying conditions. The farmers were complaining about this situation and are apprehensive that the conditions are likely to deteriorate as more irrigation is provided.

"Even though the project authorities have planned that there will be seepage loss of about 3 per cent, from experience from other canal command areas and the actual situation in the field, my assessment is that the seepage loss will not be less than 60 per cent (the canal department have not carried out detailed studies on seepage losses). This, coupled with high rainfall and deep black cotton soil, is likely to create very serious problems of waterlogging.

"Drainage is one of the very serious problems of the area. Most of the burrow pits along the canal, even at this stage, have stagnant water and many farmers were unable to sow their wheat crop because the soil did not have proper moisture conditions to plant wheat."

All low lying and riverside areas that grew two or even three crops a year before the project, have become waterlogged and in a few places are not even producing one crop. The government admits there is waterlogging, but not the extent of the area affected. To drain an area, one must start from the tail end. But the government does not know where the tail end is! So they start from the top and the result is that they do the work in summer, and in the rains, the drains get filled up. This is a very good source of revenue for the irrigation department because by the time the work is over, the drain is again filled. A number of people went to West Germany to learn how to make drains, because the landshaping was financed by the German government.

Another factor that is reducing the land under cultivation is the administrative rule under which 0.5 per cent of the area is diverted to roads, field channels and drains under the landshaping programme. This is in addition to the area acquired for canals. This means that in the Tawa command area, about 1,200 ha of land will not be available for raising crops.

### Health and environment

The water table in wells has risen. In some villages it is almost upto the ground surface. This has polluted the water and is causing water borne diseases. Hepatitis has become endemic. There is an increase in malaria because of the stagnant pools of water all over the area. The incidence of *naru* (guinea worm) is also rising, which until now was unknown in the area. Due to malnutrition, TB is also on the increase.

A semi-aquatic weed known locally as *padhar* (*Typha*) has established itself in all waterlogged areas and village ponds. Mango trees are dying due to the stagnant water table. The same is true of guava, custard apple and citrus trees.

The Tawa project promised better roads for the area, but due to faulty layout, communication from village to village has been completely disrupted. The layout is such that the roads serve more as water drains. Houses in the low-lying parts of villages like Nimsadia are collapsing.

Due to the rise in the moisture content of the soil, weeds like *Kans* (Saccharum spontaneum) are establishing themselves. It is now very hard for a pair of bullocks to plough the land. The work has to be done by tractor at extra cost to the farmer.

The cropping pattern of the area has changed. This pattern is capital intensive and market-oriented. The introduction of soybean replacing local pulses is causing malnutrition. Pulses and sesame have been bid farewell. The main kharif crops were *jowar*, sesame, cotton, *tur*, *urad*, *moong*, lesser millets and paddy in low lying areas; all these flourished without irrigation. Wheat was the chief *rabi* crop, grown on about 72,000 ha including about 11,000 irrigated hectares. The *rabi* crop rotation was wheat, linseed and gram (chickpea). *Kharif* was generally mixed cropping—*jowar*, *tur*, *urad* and *moong* (pulses)—or intercropping of cotton with *tur* was followed. With the Tawa Project, the crop pattern has completely changed. This has resulted in growing malnutrition. The people have lost self-sufficiency in food items and a balanced diet. The new cropping pattern has also affected the health of cattle. They are suffering for want of feed and fodder and the waterlogging has also softened their hooves.

### Alternatives

What are the alternatives? The dam has already come. What can be done to relieve the sufferings of the people and to make the best use of the dam? As Dr Bhumbla had pointed out, the water should not be released in the canals during the rains but only in summer, and provide only three irrigations. The canals can be taken further down, so that they can irrigate more areas with one or two irrigations rather than giving us six irrigations. Because of the change in the cropping pattern, the hybrid wheat that the government is recommending in the area needs five to six irrigations. The variety of the wheat should be changed. The wheat research station based in this area should find the appropriate variety.

### Subsistence irrigation

The best method for irrigation is to conserve rainwater by raising the moisture content of the soil. The traditional method of moisture conservation followed in the rainfed areas of India—mulching the land during the rainy season as many times as possible—is the best. By proper terracing and bunding of the fields and by check dams on the rivers from their point of origin to the tail end, groundwater can be increased. Afforestation on a large scale will also be a must.

Minor and medium size irrigation projects that do not cause environmental and displacement problems should be encouraged. Lift irrigation from wells and perennial and seasonal rivers is ideal for the area. In Hoshangabad district, there are many zones with a good supply of groundwater. Such areas should have open dug wells and tube wells, depending on the level of the water table.

These methods will not require high finance and World Bank loans. The work can be done by local people without costly machines. If undertaken on a national scale, as was once done in China, this irrigation strategy will provide employment to millions for years to come. Water will be available on the spot. Its control will be in the hands of the beneficiaries. Thus, irrigation will be controlled and will not cause waterlogging, soil salination and breach of village roads, and the 50 per cent loss of water will be saved for better use.

For such a system of irrigation, there is no need for long canals. A lot of culturable land, which is lost in water submergence, canal making and on-field programmes will also be saved. This will avoid centralised management and administration and bureaucratic interference and corruption.

Unfortunately, the Tawa dam is a fact. Steps should be taken to minimise the hazards. The first step is to line the main high canal flowing above the field level with cement. The canals serving the low lying areas should be closed from January to the end of the monsoon. The principle of irrigating more area adequately (say two irrigations for the *rabi* crop) rather than providing maximum water (say six irrigations for *rabi*) to a smaller area, should be adopted. This will enable the project to irrigate a larger area.

Proper drainage in the command area is very important. At present it is done unscientifically in a haphazard way. It is taken up anywhere without much result. The right method is to start it from the tail end. If no steps are taken to drain this water out the whole area will be a waterbound desert in the 21st century. Even trees cannot be grown on poor soils. We were told that eucalyptus is a tree that needs a lot of water, so we planted eucalyptus in the waterlogged areas, and to our great surprise, we found it does not grow there. It grows in well-drained areas and takes a lot of water.

Repayment of loans for the on-field work has become a serious problem. The farmers are treated callously. It is a social problem and is creating great resentment. The loans are so heavy that they cannot be repaid in instalments. We suggest that the loans be made a part of the total ayacut investment and part of the water charge. Otherwise, it will ruin a great majority of the farmers of the command area and the scheme will prove a curse to them.

The government knows that Tawa is not a paying project. It knows that it will not be able to recover the loan that the farmers have to pay. Illegal methods are being adopted to recover the money, like taking away farmers' cattle. Almost every farmer has to pay a loan of not less than Rs. 2,000 on 2.5 ha. If 0.24 mha are brought under land-shaping, the total loan will run into Rs. 120 crores.

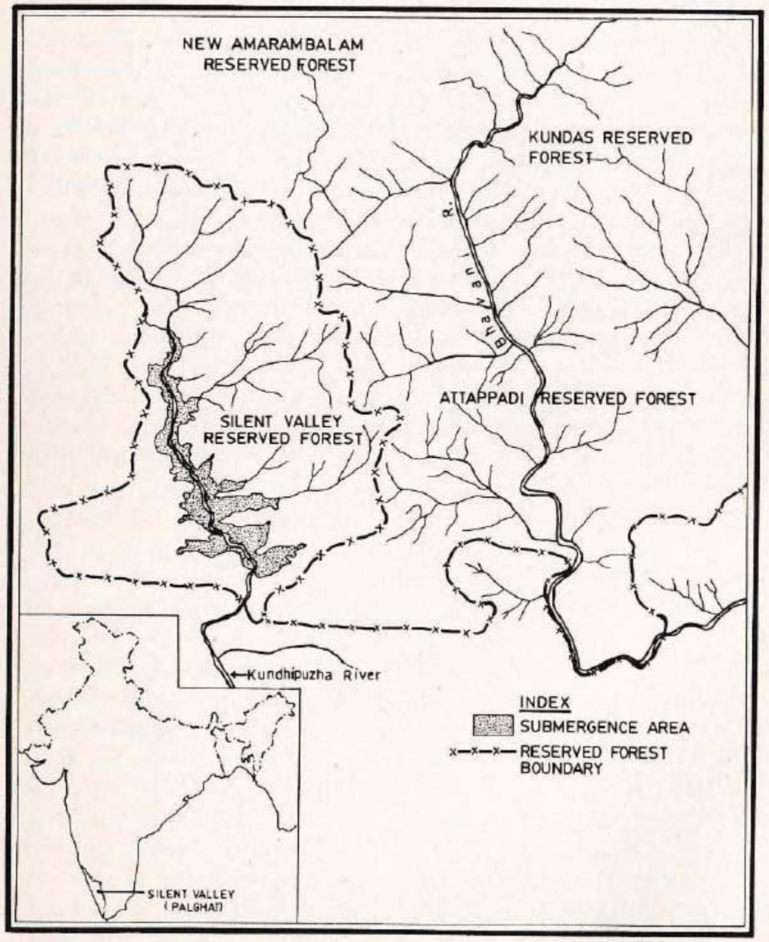
The government is aware of all these problems. For instance, the officer who was in charge of the landshaping belongs to that very area. When he was in the government, he was saying one thing; after retirement, he is saying just the opposite. Now he says that he knew when he was in the government that this would happen. So I asked "Why did you do it?" He replied : "What could I do? I was a government officer." The government said the Tawa Project would irrigate 0.24 mha. But although the project started releasing water in 1974, it has only irrigated one-third of this area. By the time they reach the target irrigated area, there may not be enough water in the Tawa dam itself because of the silting that is taking place. With its existing siltation rate, the Tawa dam will not last more than 50 years; already 15 years are over.

With wells, enough irrigation can be provided because the Tawa Project is between two rivers, the Narmada and Tawa, and there is so much water that if we dig 40 feet, it touches an aquifer. When it is well known that dams are not good, that wells are better than dams and can provide controlled irrigation, why do people still go in for these big projects? I feel that there are five interested parties. First, the contractors. They are very interested in dams coming up because they get a lot of money. Second, engineers and technocrats. Third, bureaucrats who are all in it for the same reason. Fourth, politicians who get a lot of money for their elections. And, fifth, the multinationals which supply the equipment.

Very often, we feel that it is a losing battle but we are not disheartened. When we first raised the slogan *Mitti Bachao*, nobody paid any attention. But through our ambassador in Delhi, Anupam Misra of the Gandhi Peace Foundation, we got the national papers interested in our problems, and now there is no question that the climate is in our favour.

The *Mitti Bachao Abhiyan* feels that the real wealth of a nation is its soil, its water, its forests and the things they produce and reproduce. If we lose this wealth, we lose everything.

SILENT VALLEY IN KERALA


NEW AMARAMBALAM RESERVED FOREST
KUNDAS RESERVED FOREST
Bhavani R.
ATTAPPADI RESERVED FOREST
SILENT VALLEY RESERVED FOREST
Kundhipuzha River
INDEX
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# The lessons of Silent Valley

M.K. PRASAD

Today humanity is capable of destroying itself and every vestige of life from the face of the earth. This can be brought about instantaneously through a nuclear holocaust, or gradually by degrading and destroying the environment. It is already known that many species have disappeared from the earth either due to overexploitation or through destruction of the forest habitat. Human beings can comprehend the laws of nature and make use of them for their sustenance, expansion and well-being. They have also got a fairly good knowledge of the laws of their own social evolution and today they are in a position to create their own history. But what human beings do not realise is that all their efforts to modify nature are short-sighted endeavours.

Upto very recent times, humanity's control over the forces of nature was very limited and so its doings could not affect the environment significantly. But today this is not the case. Human beings can, and have been, making significant changes in nature. The present-day experience is that the human being tends to act like the proverbial farmer who killed the goose that laid the golden egg, by destroying the capital of our natural resources at an alarming rate.

Humans have to produce food and other materials required for their sustenance. Agriculture means the protection of selected plants at the expense of all the rest. This itself has disrupted many biological cycles in nature. But more damaging is farming on hill slopes, which stems from ecological illiteracy as well as the invasion of the fertiliser-pesticide technology. Industrialisation and urbanisation have led to further environmental casualties.

Are all these activities undertaken deliberately? Humankind has a better understanding of nature's laws and can perceive both the more immediate and the more remote consequences of its interference with the traditional courses of nature. But knowledge of the bio-physical environment alone is not sufficient. It is the socio-economic environment that determines humanity's interaction with the bio-physical environment and in turn is modulated by the cultural environment.

Humans interact with and bring changes in the environment primarily to eke out their sustenance. Being endowed with facilities which we call 'human', we do this in a conscious, collective way. Humans have to satisfy their cultural requirements also. This culture has developed out of the special way in which we have extracted our livelihood from nature.

The experience of the Kerala Sastra Sahitya Parishad (KSSP) with environmental issues in Kerala, especially with the victims of environmental degradation, unscientific developmental projects, overexploitation of natural resources and deforestation, has convinced us that people's subsistence will depend upon the practice of a new conservation ethic. The Silent Valley case is a specific example of how certain short-sighted activities could have turned out to be detrimental to people's subsistence.

### Silent Valley

The Silent Valley project was to be built on the Kundhipuzha river, in the Palghat district of Kerala. It was to produce 240 mw of power, irrigate 10,000 ha of additional cropland, and provide employment to 2,000 to 3,000 people.

Although it was conceived of in 1963, for want of money, the government delayed the project. Then in 1976, a task force was appointed by the National Committee on Environmental Planning and Coordination to find out the probable preservable areas in the Western Ghats and this task force made a report on the Silent Valley. They suggested that this area ought to be preserved.

It was at this point that KSSP got interested in the issue. They deputed a multi-disciplinary team consisting of a biologist, a nuclear physicist, an electrical engineer, an economist and an agricultural scientist, and they wrote a report called *The Silent Valley hydro-electric project : A techno-economic and socio-political assessment*. The study concluded that the hydro-electric scheme would submerge nearly 850 ha of virgin forest. These forests constitute some of the last remaining tropical evergreen ecosystems in the Western Ghats. The Silent Valley is a perfect site for preservation, surrounded on all four sides by virtually impenetrable hills. The only access is along a road built by the Electricity Board. The total area of the Valley is 8,952 ha out of which 830 ha is in the submergence zone. Alongwith the forests, several precious flora and fauna species would disappear. Five animals are already on the endangered list: the tiger, the lion-tailed macaque, the Nilgiri langur, the Nilgiri tahr, and the Malabar squirrel. Until then, no one had bothered to study the area at all. Soon after, under the Department of Science and Technology, the Botanical Survey, the Zoological Survey and the Geological Survey—all *kinds* of surveys—were invited to study the area, and all sorts of wide-ranging reports were prepared.

If the dam were to be built, the first calamity would be the forests, because the forest area would have to be surrendered to the Electricity Board, and they would clear large tracts to build quarters for their employees. So forest devastation would begin even before the dam came up. Then submergence would have other deleterious effects like destruction of shoreline and riverine vegetation and the disappearance of several valuable species. Migratory fish would also perish. Eutrophication would cause problems with aquatic flora and fauna due to the accumulation of water.

**KSSP perform in New Delhi: demystifying science.** VINAY ADITYA

A nationwide campaign was, therefore, launched to save the Silent Valley. 'Save Silent Valley' movements started in various states and several NGOs within the state joined hands. KSSP spearheaded this struggle. The IUCN General Assembly passed a resolution requesting the state government to preserve the forests in Silent Valley. Scientists, research workers, intellectuals and youth supported the campaign, which was resisted by the Kerala State Electricity Board and the state government.

But with increasing pressure for conservation of this precious natural heritage, the Government of India and the Kerala government were forced to constitute a joint committee in August 1980 under Prof. M.G.K. Menon, to find out whether the project could be implemented without significant ecological damage. The committee submitted its report in December 1982. Based on this report, the Government of India advised Kerala to drop the project. The execution of the project was abandoned and Silent Valley was declared a national park.

One of the lessons we have learned out of our Silent Valley campaign, is that there is a difference between academic knowledge and people's day-to-day experience. In the case of our campaign against the pollution of the Chaliyar river, the local people were already aware of the toxic effects of the pollutants, and all KSSP had to do was to give them a scientific basis for their observations, as a result of which their struggle found a strong basis, and they won their case. In the case of Silent Valley, none of the local people believed that a dam could possibly have any bad effects. They thought we were just talking academic nonsense. We found it very difficult to impress upon people the value of a gene pool, the fact that the forest was a reservoir of genes, although we ourselves knew that we were not preserving Silent Valley just for its aesthetic or pure ecological value, but because of all the socio-economic implications.

The second lesson we learnt was that when you damn a dam, you have to start by suggesting alternatives. The state government and the Kerala State Electricity Board based their propaganda on the fact that the dam would provide electricity, irrigation and jobs, and the people in the adjoining districts firmly believed that the Silent Valley project would be the panacea for all their economic ills. It was suggested that the project would have an installed capacity of 120 mw power generation and that this project would be located at the northern end of Kerala, which was suffering from an acute power shortage. By merely looking

at a map, we showed that the Silent Valley was in the middle of Kerala, and would not solve the problems of the north. But people were clamouring for electricity.

At that time Kerala was selling power to Tamil Nadu and Karnataka. So we pointed out that if the state can transmit electricity from Idukki to Tamil Nadu and Karnataka, why can it not transmit power to the north? The Electricity Board had no answer to this. So people began to look at the wires passing overhead, and they started to ask themselves, if electricity can flow over our heads, why can it not flow here too?

It was a similar case with irrigation. The 10,000 ha of additional land that was to be irrigated, could also be irrigated with tubewells, or by tapping groundwater. The Central Groundwater Board had already done a survey of the Ponnani river basin, which passes through these two districts, and had found that there was sufficient recharge to tap groundwater.

Then we did an economic survey. The Silent Valley dam was to supply irrigation at a total cost of Rs. 20,000 per ha as against Rs. 5,000 if groundwater was used. We proposed that with this difference in price, both pumpsets and electricity could be supplied free. We also found that there was an overlapping of the area that was to be irrigated. The beneficiary area was already receiving water from the Malampuzha reservoir, which was also in the same district, and this made no economic sense at all.

Then, coming to jobs, it was argued that the project would provide 2,000 to 3,000 extra jobs. But for how long? Only during the construction period. Whereas if we resorted to tubewell or groundwater irrigation, this would generate an additional 5,000 jobs on a permanent basis. We also suggested that by installing a 220 kw transformer and transferring electricity to this area, it could be used to start industry. Our logic was that since we have no shortage of electricity, but we do have a dearth of raw materials like iron ore, we could take half-finished goods from places like Bokaro where there is an acute power shortage, and base our industry on this.

These were the various alternatives we offered. The campaign had its side-effects on us too. When we started to talk about the relation between forests and agriculture, we also started to talk about forests and fisheries, forests and rainfall, and forests and climate. We started to talk about high efficiency—how we can improve on the *chulha* and save firewood. All sorts of issues came up, and the campaign grew bigger and bigger. The result was a very large network, which started a system of public environmental education in our state.

KSSP's environmental awareness programmes for the public are specially designed to include this factor. In our campaign to save Silent Valley, we fought to save forests not for their aesthetic or pure ecological value but for preserving a genetic pool with its socio-economic implications. We related conservation issues to the needs of the future generations and propagated a new ethic. For KSSP, development must be understood as enabling the majority of our people to come out of their sub-human conditions in the economic, social, political and cultural spheres. This is a goal which all of us must strive for. In this pursuit, both the human and the biophysical dimension of our environment has to be taken into account. There can be no compromise on pollution which cripples the lives of a vast number of poor people, and which generates only a few thousand jobs. Pollution is not a price to be paid for more employment or income. Drinking water, sanitation and housing must be provided before we talk of prestigious projects and programmes.

**Saint:** Prasad mentioned that the KSSP was looking forward to celebrating its silver jubilee next year. This is probably the longest period of involvement in science education and also probably it is one of the organisations with the most sophisticated approach to environment questions from a scientific point of view. Has the KSSP tried to develop a critique of the present planning in ourcountry as a whole or in the state of Kerala? Prasad will agree that the present mode of planning did not consider environmental issues in any significant way until very recently, only since the last Five Year Plan perhaps. But, overall, environmental planning in our country and in most other countries is not the concern of national plans.

**Prasad:** With regard to a critique of planning, the KSSP has been doing this in the energy sector for the last two Five Year Plans. We have, in a sense, been able to put across this idea in the State Committee for Science, Technology and Environment, which in its last annual meeting accepted this as its own approach, though it did not credit KSSP! As far as planning for the entire country is concerned, I fully agree with Kishore. I am not in a position to say that we are capable of doing it, but we should take this up as a challenge.

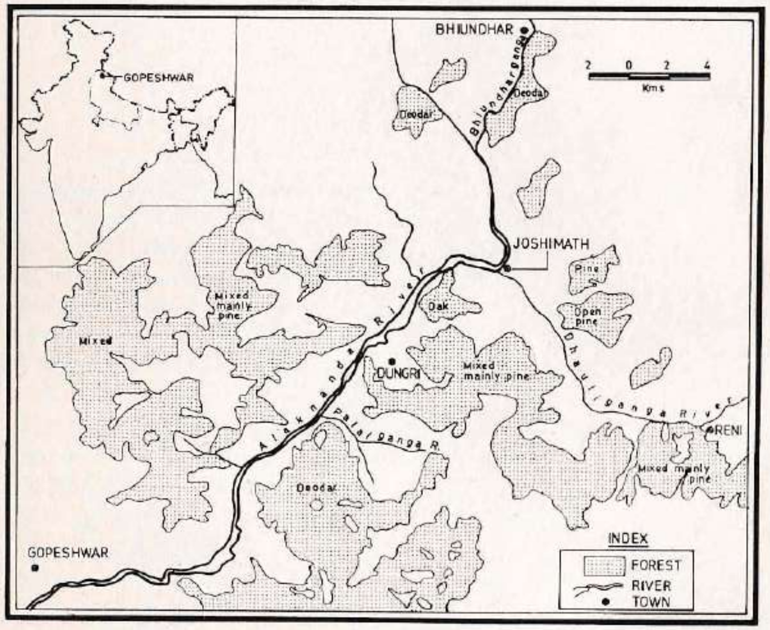
# The Chipko Andolan: Forest conservation based on people's power

CHANDI PRASAD BHATT

To maintain ecological balance, it is very important to keep the various components of nature in total harmony. This is being increasingly understood and talked about nowadays. The most important element in nature is the forest. The human race is being pushed towards rapid industrial growth by the growing pressures of population and the culture of increased consumption. Industrial development has not only led to an excessive exploitation of nature and the alienation of human beings, but has left human beings with no other choice but to join the rat race by moving into industrial and consumption centres, namely, huge cities. The industrialisation policy in the Third World is city-oriented. The emphasis that has been placed on large and centralised industries is posing a challenge to administrators. On the other hand, villages continue to be neglected.

The raw material for industry comes from the rural hinterland. There is not just a physical distance between the towns and the villages but also psychological, social and economic distances. Because the urban consumers are not aware of the real situation in the hinterland, they are not able to establish a harmonious relationship with the rural reality. Instead the consumer takes on the role of an exploiter, together with industrialists and traders. The exploiter has no regard for the sustainability of resources and, hence, makes unrestrained use of them, remaining least concerned about his or her own survival. We have extremely serious environmental degradation taking

UPPER ALAKNANDA
SENSITIVE CATCHMENT



place because we no longer have any sensitivity towards nature.

Nobody is paying attention to the warning of Mahatma Gandhi: "Nature has enough for everybody's need but not for everybody's greed." In this race to obtain raw materials, full use is being made of the earth and its protective elements like forests and vegetation, and today the situation is such that the forests have almost disappeared from the earth. Because of this, village people not only face acute shortages of firewood, fodder and building wood and raw materials for village industries, there is also the prospect of climatic changes and an increase in the fragility of natural ecosystems, with soil erosion and air and water pollution posing a threat to humankind. That is why it is now being widely understood that we must not only protect the remaining forests but also bring about a rapid growth of forests in the world.

At least a third of the area in any country should normally be under forests. Only then can environmental problems be solved. In India, forests do not cover even half of the required area, and even the remaining forest area is declining rapidly because of growing industrial and urban demands. Satellite pictures prove that India is losing forests at the rate of 1.3 mha a year. These figures of deforestation are eight times those given by the forest department (The State of India's Environment, CSE, 1984-85).

Not only are our forests being logged, but forest land is also being used for various "development" projects like dams, river valley projects, industries, roads and agriculture. Between 1951 and 1975-76, 4.2 mha of forest land was used for these projects, despite the fact that forest area per person is only 0.14 ha now. The demand for forest products is increasing geometrically. This is a frightening situation and it shows why it is so important to protect the remaining forest vegetation on a war footing.

Nobody can deny the use of forests by people for their basic needs. But the government itself is a culprit in the exploitation of forests in the name of so-called welfare. Destruction continues in the name of development. Most villagers in the Third World have a lifestyle that is largely dependent on forests. Their daily needs of energy, fodder for animals, and wood for huts and homes are all met by forests. Village people even today mainly use wood as their source of fuel for cooking. People living in villages and backward areas now have to walk miles to forests to collect wood. In the Himalayan areas of UP, forests have receded so far away from villages that women have to leave home as early as 4 am to fetch wood and they return late at night after long journeys, up and down hills, with a load of 25 to 30 kg. This problem is becoming more and more acute.

## The origins of Chipko

Government officials claim that their forestry is based on scientific principles. The forest department has been talking about forestry science for a long time. But the declining area under forests has made it evident that this forest science has not proved to be very successful for forest conservation. The working plans of forest departments have not proved very practical. This has come to be widely understood over the last 15 years.

**Women in Chamoli carry tremendous loads over difficult terrain.** CSE

One result of this was the birth of the Chipko Andolan (the movement to hug trees to save them). The people of the economically backward Uttarakhand region, situated in the central Himalayas, raised their voice for the first time through the Chipko movement, to say that their life is mainly dependent on forests. Their relationship with the forests operates at two levels — one through the maintenance of the ecological balance and the second through traditional practices.

The Himalayan region is full of high mountains and valleys, with different types of vegetation, flowers, pastures and glaciers. This is one of the most beautiful areas in the world. It keeps the atmospheric circulation in balance over a large part of the Indian sub-continent. This region also gives rise to the Ganga-Yamuna river system with tributaries like the Bhagirathi, Alakananda, Sharda and others. These rivers are born out of glaciers. As they pass through forest-covered mountain valleys, they collect water from hundreds of streams before they enter the plains to become the source of life for millions of people. The rain water from these forests is released gradually over the year to the rivers. The forests help in preventing soil erosion. The food system also depends on these forests.

A disruption in this interrelated system will lead to a direct impact on the food and water systems of the people. On one hand, forests are central for the maintenance of a balance in the physical environment, on the other, the focal point of the ecological system — the human being — is directly dependent on the forests. Various products such as firewood and timber, grass, vegetables, honey, medicinal herbs and fruits come from forests, and agriculture and animal husbandry are also dependent on forests. For these reasons, ecological balance and traditional human relations with forests are so intertwined that it is difficult to see them separately.

In the last three decades, the heavy destruction of forests has degraded not only the natural environment but also the daily life of villagers. There was discontentment among the people, but they received their biggest shock in the 1960s, when, under a working plan, trees were cut on large scale. This increased the intensity of the 1970 flood in the Alakananda river, which swept away six bridges, 16 footbridges and 25 buses. Hundreds of people and animals died. In 101 villages, 604 houses and 500 acres of crops were destroyed. Roads were blocked. In Srinagar (Garhwal), 100 km from Chamoli, the ground floor of the Indian

Telephone Industries buildings was underwater and a 6 foot layer of silt was deposited there. Similarly, 300 km away, the Upper Ganga Canal, which emerges from the Ganga beyond Hardwar, was silted 2 to 3 metres deep for a length of 10 km. The canal was closed and crops over .38 mha in Saharanpur, Meerut and Muzaffarnagar districts were affected. More than Rs. 10 million were spent on desilting the canal and several millions of rupees worth of direct and indirect damage took place. The exploitation of forests, on the other hand, only yielded an income of Rs. 10 lakh over the entire decade. Despite this, exploitation of forests for commercial purposes continued and no thought was given to stopping or reducing it. Between 1973 and 1977, the people of Gopeshwar, Mandal, Phata, Rampur, Reni and Bhyundar in the Chamoli district, situated in the watershed of the Alakananda, had to protest at least half a dozen times against the forest department's working of forests.

In the end, a committee of experts under Dr Virendra Kumar, following the Chipko Andolan in Reni, agreed that the issues raised by the villagers were scientifically correct and forestry based on so-called forest science was wrong. The forest department's working plans, which had been prepared and supported by its technical experts, were thus challenged by ordinary village people and proved wrong. This brought the Chipko Andolan to the notice of environmentalists and the government and it is today known in many parts of the world. The Andolan, which started by saving the forests, continues to insist on the need for conservation of forests and draws the attention of the government towards it.

### Six principles of Chipko

Chipko activists have prepared a six point memorandum of demands. The memorandum asks the government to undertake the development and conservation of forests in tune with the needs and expectations of the people living in and near forests, and in tune with the needs of the forests themselves.

1. It is important to understand what the forest itself wants. The Chipko volunteers believe that in a particular geographic situation, only specific trees or vegetation should be grown, so that appropriate needs of fertiliser, soil, water and energy can be met. And till the forest is not able to take care of its own survival, it needs the support of human beings for its protection. Even more important is that there should be a detailed

analysis of the social and economic conditions of the people living in the forest areas. It is axiomatic that only people living near forests can establish a practical and harmonious relationship with the forests — none else can do it. The traditional relationship of the local people with their forests should also be carefully seen. Detailed analysis on these issues will help to establish the type of forestry required.
2. The Andolan demands that areas affected by landslides and soil erosion or where forest areas are crucial for conservation of water resources, should be identified and reserved.
3. The minimum needs of people living next to the forests, who have been customarily using them for their survival and their village economy, should be established and the administration should be such that these rights are exercised easily by them.
4. The contractor system should be completely stopped in forest conservation, development and exploitation, and instead, people living in forest areas should be organised to undertake all these activities.
5. Trees which are of use to villagers should be planted near the village so that village people do not need to go into the reserved areas.
6. Village industries should be set up, based on minor forest produce so that the local population can get jobs and migration from villages can be stopped.

Although the forest department has come to acknowledge the Chipko movement, it has not been able to develop a forest conservation and development policy based on these principles. This is why there is no correlation between the actual statistics of afforestation and those on paper.

### A good start

In his broadcast to the nation in January 1985, Prime Minister Rajiv Gandhi, keeping in mind the need for forests and wastelands development, announced: "The increasing decline in forests is bringing upon us various environmental, social and economic dangers. This trend will have to be stopped. I propose the immediate establishment of a National Wastelands Development Board which will meet the target of afforesting 5 mha of wastelands with fuel and fodder trees. We will start a people's movement for afforestation." This is a clear indication of the need to begin afforestation.

Despite all the rights, privileges, means and technical knowledge available to the forest department, the survival rates of trees planted by them are far lower than those planted by people's will and power. The main reason is that government programmes make no attempt to seek the participation of people in practical ways. We even find examples in which the people oppose official afforestation and forest conservation efforts. This is because when people are not taken into confidence and their aspirations not accounted for in the development of the very forest on which their lives are dependent, they do not respond to these programmes. On the contrary, all programmes thrust upon the people are rapidly leading to disputes over land and villagers are refusing to co-operate.

### Afforestation as a people's movement

The Chipko Andolan believes that the development and conservation of forests is not possible simply by making laws or passing prohibitory orders. A survey of Asian forests clearly reveals that their degradation is the direct result of government policies.

On the one hand, the government's forest conservation policy allows the sale of forest produce in international markets and metropolitan centres at competitive prices. On the other, people living in forests have lost their rights. We must recognise the fact that forests are a basic need — villagers cannot be separated from their forests. Even if we forget all the other needs that forests meet for the moment, we cannot stop people from cutting firewood until appropriate, simple cheap and acceptable alternative means for cooking can be found. We will have to plant many more trees than are being consumed. Gobar gas plants can be established as an alternative to the use of firewood. In the same way, wherever adequate water sources are available, a series of micro-hydel units could be set up in the mountains.

**With baskets emptied of manure, women return after a hard day's work.**
**CSE**

Of all these alternatives, afforestation is the simplest. It will not just solve the energy crisis, but also help to maintain ecological balance and control the ravages of soil erosion, landslides and floods. Humankind will be liberated from this threat of ecological destruction that it faces today.

Chipko believes that the only way out is to create awareness based on people's education. No plan for afforestation can succeed without people. Those living next to forests must love and respect these areas. Their interests must coincide with those of the forests themselves. All this will only be possible when the economic interests of people are associated with the forests. They must realise that forests are the basic foundation of their current living standards, and that their survival will be at stake once the forests disappear.

In the Himalayas and all those areas where the pivot of the family is the woman, women must be made partners in the protection and development of forest wealth. Women are more sensitive towards forests because in these areas, they have a more direct relationship with them. The Chipko Andolan has always seen women at the forefront.

### Development of people's consciousness

In their bid to save their forests in 1974, the women of Reni village, situated in an extremely sensitive region of the Alakananda catchment, had called their forests their "mother's home" *(mayaka)*. They told the lumberjacks: "This forest is our mother's home. If the forest is cut, the soil will be washed away. Landslides and soil erosion will bring floods, which will destroy our fields and homes, our water sources will dry up, and all the other benefits we get from the forests will be finished." In the same way, in 1975, 200 women from Gopeshwar waged a struggle against the district authorities to save their oak trees. Later, the women of Bhyundar village, situated in the lower reaches of the world-famous Valley of Flowers, had also launched their

Chipko movement. They went into the forests to protect them, braving heavy rain.

The Chipko Andolan has also made forest administrators realise yet another weakness, that women are never involved in forest protection. In 1980, the women of Dungri-Paitoli villages, situated in an extremely remote region of Chamoli, had launched Chipko. They asked the district authorities a simple question: "When we undertake all the work related to forests, why was our opinion not taken when it was decided to auction these forests?" In this village, the village councillors (*panch*), who were all men, had unanimously surrendered their oak forest to the government. The area was to be converted into a potato farm; the government's horticulture department had also, without using any intelligence, made plans to cut down these forests. But the Dungri-Paitoli women saved them. Very recently, 200 women of Bached village intervened to stop the logging of 1600 trees in the Thantri forest near Gopeshwar, which were being felled to meet the fuelwood needs of towns. The women said that even if these dead trees were cut, it would lead to soil erosion because of logging practices, and their own hearths would remain cold.

Chipko has always insisted that all those who talk about the welfare of humankind while talking of forests, must also think of the welfare of those living near the forests. The alienation of people living near the forests will not help save the forests and the adverse effects of deforestation will have to be suffered by all living beings. Therefore, integrated programmes for forest dwellers must be formulated, recognising them as the lead actors in bringing about ecological harmony.

### Experiences of Dasholi Gram Swarajya Mandal

The Dasholi Gram Swarajya Mandal (DGSM), the mother organisation of the Chipko Andolan, has been successful in understanding this psychology of the villagers. Other than its participation in the Chipko movement, the DGSM has been active in making villagers understand the importance of forests and in seeking their active participation in afforestation and conservation.

It has been organising a series of ecodevelopment camps in the areas seriously affected by landslides and soil erosion in the Alakananda watershed in the Central Himalayas. These camps prepare the villagers psychologically to recognise the importance of forests as the foundation of their future growth, without which all their economic, social and traditional values will be at stake. Once they come to accept this, their participation is automatic.

Under the leadership of the DGSM, dozens of camps are organised every monsoon and winter in which people participate with great keenness. Educational discussions are held and people donate their labour to plant trees. The impact of these activities has steadily spread from one village to another. The main participation is of women as well as of scientists, youth, students and voluntary workers.

The camps begin with local songs dealing with forest protection and discussions take place on local problems and their solutions. All participants take part. Voluntary labour (shramadan) is an important aspect. Drums and various local instruments are played while people work. They go to the tree planting sites singing and shouting slogans. Barren land lying waste around the villages is greened by planting trees chosen by the village women to meet local needs. Plants are given water and compost. During the five to ten days that the camps last, the village has a festive atmosphere. Women from distant villages also participate in these camps and learn from each other's experiences.

The survival rate of saplings is surprisingly over 80 per cent and in some cases, as much as 95 per cent. It is high because the villagers take pride in these trees and take care of them collectively. The forest, once protected, begins to provide fodder in just six months. It is then distributed, according to local custom, after consulting every family. There is thus no dispute nor any recourse to law. In the same way, improved chulhas to save energy and reduce smoke are being built in village homes as part of a people's movement. Women play a major role in these camps. Women's organisations in villages often remain very informal. Programmes have not been thrust on them from above. In some places, these organisations are extremely active and have tackled problems of basic needs like fuelwood and fodder.

DGSM encourages people's participation and sometimes provides technical and partial financial assistance. The volunteers educate people through these camps and try to get decisions taken by the people implemented. These experiences have given DGSM workers a good insight into the environmental history of the region. It is with this understanding that the volunteers encourage the people to become self-reliant and explain that this is the people's strategy. People are being encouraged on the basis of their own experience. As an experiment, DGSM has been promoting agroforestry as a means of improving soil and water conservation in two dozen villages along the Alakananda river and its tributaries — Mains, Garudganga and Patalganga. This area was most affected during the 1970 flood. Wild animals always destroy crops there. DGSM has encouraged people living in these watersheds to protect their fields with stone walls at very little expense. The walls are constructed at a short distance from the fields and in the space between the walls and the fields, grass and fuel, fodder and fruit trees are planted, and their use determined by villagers. Crops have been saved from wild animals and villagers have also reaped the benefit of their labour.

Soil erosion around the fields has also been prevented. Villagers who had to go miles to fetch grass for their animals can now obtain it near their own fields. This is a matter of great satisfaction to them and this programme is now being taken up with great enthusiasm in other villages too. The Ḍudhatoli Development Organisation is following suit in a remote part of Garhwal.

In many places, villagers themselves come forward to take up such programmes. Impressed by the success of such rural people's participation, Dr M.S. Swaminathan, former member of the Planning Commission, suggested that the government should also assist these programmes; after that, the Planning Commission provided funds. In recent years, the Department of Environment has also been funding ecodevelopment camps.

This experience makes us say with confidence that people are keen to take part in development work. But they have to be prepared for it. It has been a great weakness of our planning that we have not been able to develop and use the will power of the people.

Society must become a partner in forestry. Governments must realise that the human pressure on forests has increased so much that forests have disappeared near human settlements. Forest lands are lying barren, while people have to go far into government forests to meet their needs. People want to be liberated from this situation and want forests of their own to which they can go as a matter of right. They do not want to fight all the time or be humiliated.

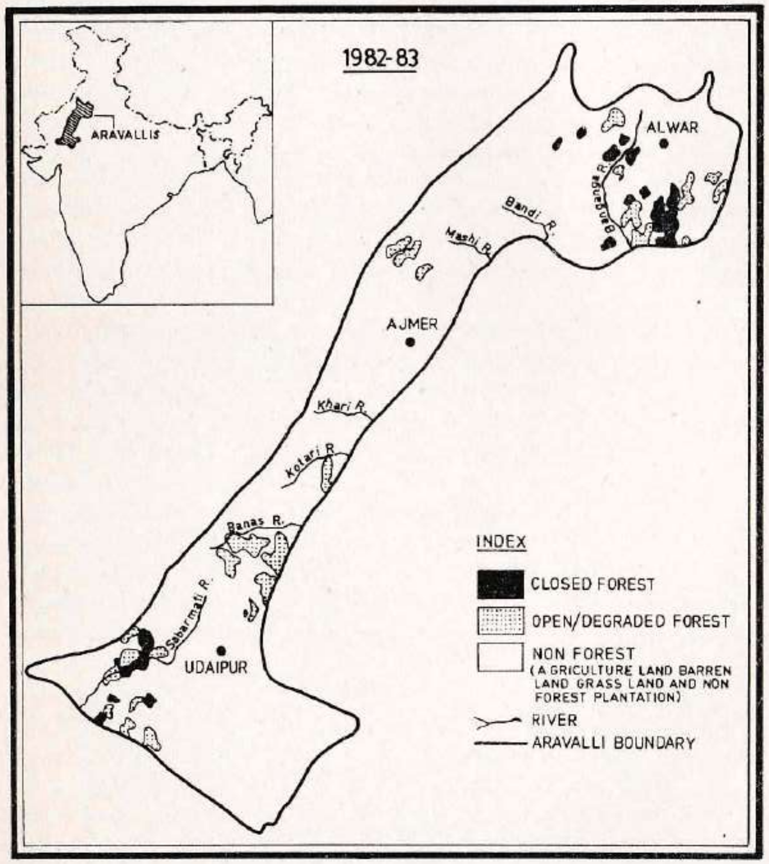
Programmes should be such that every village — and if possible, every family — can have trees of its own. The government controls the forests around many villages. Such forests should be

taken away and handed over to village communities. The money allocated for village forests should not be given to government departments but to village councils and voluntary agencies situated in the villages. Every four or five villages should have a forest department worker who can assist the villagers to meet their needs.

It is also important that those varieties of plants be provided which match local needs and ecological conditions, and afforestation be taken up as a people's movement. Planning will have to be undertaken at the village level itself, so that people participate in forest conservation in a practical way.

Today the impact of deforestation on the ecological balance is not restricted to a particular area or country. This is a worldwide problem. It can be solved only with the participation of the common person.

ARAVALLIS
FOREST COVER



# Seeds of change in the Aravalis

KISHORE SAINT

Despite our lofty sentiments about Chief Seattle and Mahatma Gandhi, contemporary environmental concern is elitist in its origins. It has arisen out of reduced opportunities for enjoying nature and an increase in discomfort and danger due to pollution and the depletion of natural resources.

Of late, there has been a two-way discovery. The wildlife-loving environmentalists have found that there are people in and around the sanctuaries and wildlife habitats they wish to protect. The "people-*wallahs*" or "poverty alleviators" have discovered that environment is nothing other than the primary, productive resource base of the poor and that poverty is aggravated by the degradation of this resource. It is also being realised that this deterioration is often the consequence of development activities such as mining, industrialisation and dam construction.

The situation is particularly grim in the case of indigenous tribal and ethnic groups whose life-support practices were closely integrated with and dependent on natural productive cycles. To this category belong the Bhil, Garassia, Gond, Oraon, Santhal and hundreds of other tribal communities of the plateau and hill regions of western and central India and the *ghats* (hills) of the southern Indian peninsula. The full story of how their natural resources were taken over and destroyed by legal and illegal means and by commerce and development, both planned and unplanned, has still to be written. But in situation after situation, the forces in command have brought about alienation, displacement, destruction and impoverishment. The ineffective, meagre and half-hearted efforts at compensation and rehabilitation have not mitigated these ravages.

At the local level, both traditionally powerful and new predators have encroached upon the common pastures and water resources with impunity, thus, not only taking over what was earlier a community resource but also undermining the community pacts and responsibility that existed for control and protection. This local and systemic onslaught has been nothing short of a war against these communities. This is reminiscent of the massive aggression that the American Indians and Australian aborigines were subjected to in the course of the European conquest and settlement in the New World and there are likely to be similar consequences for the tribal communities involved here. In the present phase, the members of these communities are being reduced from proud and self-reliant agriculturists, pastoralists and gatherers of forest produce to itinerant and destitute coolies. Of course, it is Orwellian and ironical that all this is being done within the framework of a progressive constitution and for the sake of development aimed at poverty eradication.

That this is not a far-fetched and unlikely depiction has been brought home dramatically and powerfully by the African crisis of 1984-85. It is now being clearly admitted that development can and did go wrong with disastrous impact on environment as the people's subsistence base. This major tragedy of the post-second World War era has been studiously underplayed in the Indian press. Live Aid and the Runs received more coverage than the actual disaster and its causes. This reflects an innate tendency on the part of those in command to avoid facing the unpleasant reality until it overtakes them.

This is what happened in the case of data on reduced forest cover and extent of wastelands—true information on both was denied. This is the attitude in relation to the regions like the Aravalis in Rajasthan inhabited by the Bhils, where all the advance warnings of another Ethiopia-in-the-making are writ large on the face of nature and undernourished children and prematurely aging adults. Such is the social character of a parasitical elite, hell-bent on living it up and getting rich quick through the ruthless exploitation of its internal colonial pockets. Their numbers and their wants have multiplied manifold.

Gandhi called them heartless and pointed to the disastrous social and environmental consequences of the greed of a small nation like Britain and warned as to what would happen if a populous and large country like India took to greed and envy as the engines of development. Like a plague of locusts, we shall eat

up not only our own but also the rest of the world's resources, he cautioned. Gandhi lived in an era when Belsen and Auschwitz took their toll of those considered inferior and dispensable. Today the same cold calculation has translated itself into the Lifeboat Ethic. There is not enough room in the ark. A certain proportion must be allowed to perish to lessen the burden, and the lives and luxuries of those who matter must be protected by economic and socio-political arrangements, if possible, and by brute force, if necessary.

Unfortunately for the elite, there are two serious flaws in this design. First, those imperilled number millions. In the sheer effort for survival, they will bring about further decimation of what remains of natural resources and do irreversible damage in the form of permanent desertification of subcontinental proportions. This may or may not be a conscious 'scorched earth' policy on their part but the result will be the same.

Second, a more hopeful possibility, is the resistance to alienation, displacement and mass development and preference for wholesome subsistence, together with the realisation of danger to their future and their own potential for recovery and regeneration. Both these responses are discernible but by far the stronger trend is the former. The pockets of resistance and attempts at alternatives are few in reality.

Overall, especially after the African crisis, there are the beginnings of doubt about 'development' and an openness to traditional, indigenous modes and know-how for subsistence, survival and regeneration. There are also opportunities and possibilities for bold initiatives. At least in the Indian context, the cultural ethos, the moral legacy of Gandhi and democratic functioning, assure support and recognition to such experiments taken up by concerned and capable individuals and groups in an empathetic relationship with the communities and environments in distress.

Successful demonstrations of this kind could set in motion a widespread movement that combines poverty, environment and peace. These are challenges and imperatives that await the attention of the valiant and the worthy. Only by taking up these will environmental concerns be made universal and ethical in the sense that Chief Seattle and Mahatma Gandhi understood it.

Environmental concern was deeply integral to Gandhian constructive work and rural reconstruction movement in the pre-independence era. After independence in the late fifties its rationale and scientific basis was articulated by Gandhi's biographer Pyarelal in four chapters of 'The Last Phase' published separately as 'Towards New Horizons'. The concern was given practical shape in the experimental effort of J.C. Kumarappa, Annasaheb Sahasrabudhe and others in the Gramdan-Gramswarajya context. But these were short-lived as mainstream constructive work was transformed into institutionalised *Khadi* and village industries, prohibition, tribal and scheduled caste welfare, and later poverty alleviation-oriented rural development. In one form or another, all of these became appendages of the modern capitalist mode of development and as such were bereft of environmental considerations.

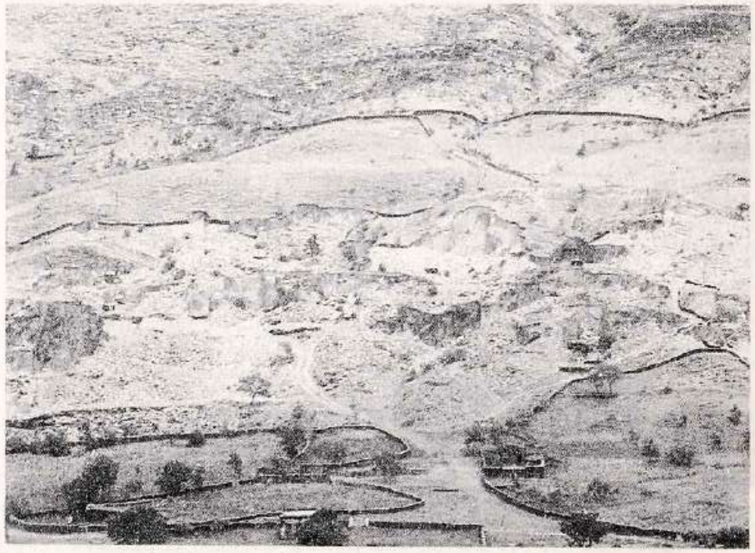
This has been consistently true of people who have been involved in poverty alleviation. Even today their concern for basic resources—water, land and vegetation—is still marginal. But the understanding is probably growing, especially in areas like ours where the crisis is mounting constantly because of frequency and severity of droughts, water and food shortages.

Rajasthan is right at the western extreme of the country. It gets increasingly dry as one moves from east to west of India. In the Aravalis and eastern Rajasthan, the frequency and severity of drought is increasing and with it, the distress of the people. This year again (1986-87) there is very severe drought in the state as a whole, with all the problems that go with it. But, in a poor and backward state like Rajasthan, with a deficit economy dependent on the Centre's aid, even in normal times it is not able to provide timely and sufficient relief work. Alternative employment is needed for the people and on a massive scale. In the absence of such work, there is further destruction of the remaining tree cover. The only means by which people can survive in remote, hilly villages, where work is not available, is by cutting trees, headloading and making charcoal. That is their livelihood and it increases whenever there is drought.

This trend has been worsening in the last two decades. It is not difficult to see that regions like southern and eastern Rajasthan are in an advanced stage of crisis, similar to that which Ethiopia has experienced. There is a cumulative process and time is not on our side in these crises. We have heard about the time that is required for the trees to grow and yield income. I think there is another time frame. If in the next ten or 15 years, substantial action is not taken in those regions, we can end up with irreversible damage. Forest lands can regenerate themselves, if

left alone, once the pressure of grazing is relieved. But that is true only to some extent. A stage is reached when rainfall and climate are badly disturbed. This climatic aspect of desertification and irregularity of rain, the unreliability in meeting the needs of vegetation, whether crops or natural growth, has not been paid attention to. When the environment is seriously disturbed beyond a point, the situation becomes irretrievable. This is how the great deserts in the world have grown. Not only the human but the biotic and climatic factors have to be taken into account.

We have been making a small effort in five villages in the Aravalis near Udaipur. It is a group of hamlets, 500 families of mostly tribals. This number of families has been reached over the last three or four generations and today they occupy an area of around 1000 ha, which includes community pastures, private pastures and cultivable land. At the beginning of the century—we made some enquiries to find out what the situation was then—there were 20 families in this very area of something like 1000 ha with 70 to 80 per cent of the forest and grass cover intact. Today there are 500 families spread over the same 1000 ha and 90 per cent of the forest and vegetation cover have gone. It is such an area that we have taken up.



**Deforestation in the Aravalis: increasing hardships.** CSE

I have been involved there for over a decade, earlier working on adult education, rural development and agricultural improvement programmes. I gradually realised that there was a more basic problem—that more basic damage had been done and was continuing. Literally, the earth had to be saved and regenerated if there were to be any kind of future for these people. So with that in view, we started discussing with the people what was to be done.

We talked to them about the danger of continuing to cut trees and make charcoal. They understood. They accepted that it was harmful. "We may not leave anything for our children to come," they said, "but what is the option? How do we survive in this situation?" We also tried to inculcate a sense of *satyagraha* in the romantic hope that people in this kind of crisis of survival would realise that there is no future and would not destroy forests. Instead they would launch a movement to demand their right to replant trees. I have to admit that with people in such destitution and distress, there was little interest in any action of that kind.

When there was no help available at the district or state level, for us, there was no option but to go to government levels beyond that and launch a programme which would both provide employment for sustenance and, in the process, help regenerate the resources of the people. We took this up, to begin with, on people's own private wasteland (pastures which had become degraded.) We began two years ago with one small tract of 20 ha of such pastures belonging to 40 families. That is where we first demonstrated what happens when this piece of land is protected from open grazing. It has been pointed out how very complex is this task of promoting protection. In the situation in which we found ourselves, we could not persuade people to stop open grazing, as was needed, and do what is known as "social fencing". There was no option but to build stone walls for the protected tract, four feet by two feet, which provided employment, and we planted some 6000 saplings, mostly indigenous species.

The interesting part was that the first benefit and source of hope for these people was clearly not the trees but the grass that was restored to this land after the first rains, because grazing had been totally eliminated. This was last year, which was deficient in rainfall. But there was so much fodder that it lasted right into the dry season. That convinced people that protection and curtailment of open grazing pays; after that, interest increased in this kind of work.

We planned a scheme on 20 to 160 ha of land belonging to individual people and communities. We also pooled private lands because that saves the cost of protection and building walls. The smaller the unit, the greater the cost. Our target last year was 160 ha. We also had peoples' and farmers' nurseries with about 2,00,000 plants and we protected over 400 ha. Interest so boomed in the area that with first one demonstration, we eventually planted 2,40,000 saplings.

After completing this year's programme, again a drought year in which we were expecting no more than 30 per cent of the plants to survive, the main gain was that fodder reappeared. All these plots—there were 15—are visibly distinct; their cover is different from the surrounding ones. The land around is brown and bare with stones protruding. In protected patches, the land is covered with local nutritious grasses; even in the lean season there is going to be sufficient fodder for the communities. This has sparked further interest. Last year we tackled over 400 ha; this year we feel confident of covering 1500 ha.

This is based on the demand from the people. I want to stress that the need exists; everyone recognises it. But to convert this need into a people's demand is a major task, where support is needed at the grassroots. It does not happen spontaneously, though in some places it can. This is where voluntary organisations really have to work.

The second task is to bring financial and technical resources to develop degraded land. Without that, it is a no-option situation. You can give the people land as in a reforms programme. Where good land has been given, people have developed it. But the kind of degraded lands we are talking about, will not improve without support for development. So resources and technical guidance are needed.

But the main support needed—and I think this is the basis of our success—is to help people to manage these areas themselves, individually and as groups. With these wastelands or wasted lands, people are becoming alienated from the land as a resource. They are feeling separated *(alag)*, as if the land does not belong to them, or it is worthless, that they must leave and move on.

A part of the task with land reforms and giving access to land, is restoring people's confidence and their link with the land.

This factor is often underplayed. People talk about usufruct rights, but with this, ownership remains with somebody else—an impersonal agency like the state; the tribal feels 'it does not belong to me'. These farmers, like all others, want to feel that this land, this *dharti*, belongs to them. I have been hearing about tree *pattas* (lease for the tree but not for the land) for a long time. We can try it but it will not get very far. The lessons that have emerged from our work are that ownership has to be on a dual basis—both individual ownership of a certain amount of land and the community owning some—and resources and sustained developmental support have to be provided for 10 to 15 years because the land is very degraded.

How do we make this a reality given the existing political will? The National Wastelands Development Board exists. It can support work like ours or of half a dozen or even 50 other projects. That is not going to make a difference. I have no illusions on that count. In our area if the destruction has to be stemmed, this work has to take place over a region of 2000 sq km. I am talking about the Aravalis, which cover an area around 2000 to 2500 sq km. That is the size of the western ramparts of the country against the Thar desert. This work has to take place on that scale. Now can it? This is the challenge. To meet the challenge of people's subsistence, there is a need for a people's movement in relation to environment. No political party is interested in developing this people's movement. This challenge has to be met by the voluntary movement.

# Women, environment and people's subsistence

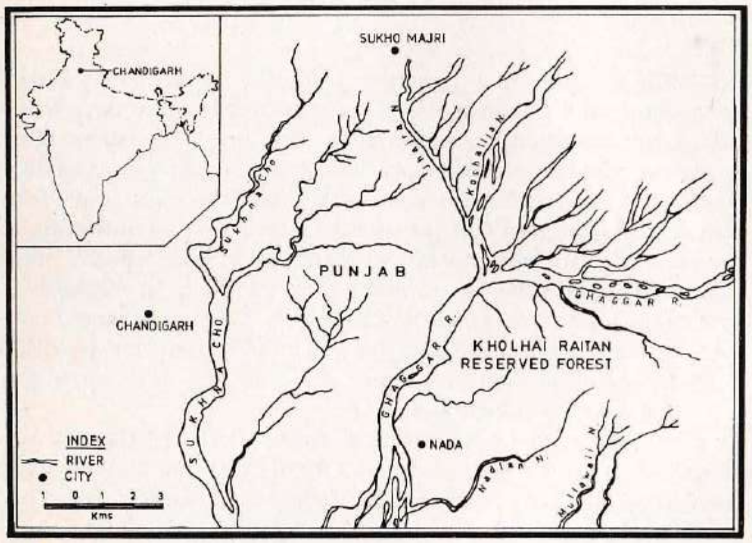
MADHU SARIN

The environmental question in India is intimately linked with continued dependence of large sections of the population on a predominantly subsistence economy. A subsistence economy may be defined as one where people meet most of their basic needs of food, shelter and clothing from their immediate natural environment (land, water, plants) either by gathering or growing. Within this context, women tend to have a much closer relationship with the environment than men—more markedly in some regions and cultures than in others. Women are more concerned with the immediate, the small, the micro-levels of life activity and potentially represent the most powerful protective force towards the environment.

Historically, many communities (particularly tribal ones) subsisted on an integrated system of food gathering and growing food for their own consumption. Keeping domestic animals became a supplementary activity. Stall feeding of animals still remains an alien concept among them as traditionally, these have been left loose for grazing in forests and common lands.

With the uneven development of the country's market economy, the viability of micro-subsistence systems has been coming under increasing strain. On the one hand, we see islands of so called development which are closely integrated with the world economy. On the other hand, such development has made increasing demands on the natural resource base of the subsistence sector. State laws, development policy and various other coercive instruments have been specially formulated to facilitate this process. A major consequence has been that the traditionally

LOCATION OF WATERSHED DEVELOPMENT PROJECTS NEAR CHANDIGARH



harmonious relationship between people and the environment in the subsistence sector has started taking an acutely negative form. Poverty, combined with increasing destruction of their natural resource base, is compelling large sections of the population to exploit it in a non-sustainable manner. When it is no longer possible to subsist from a decimated environment, it is abandoned in search of survival in the cities.

Here, I would like to emphasise that micro-subsistence systems have seldom been destroyed by pressures of only local populations. Increased resource outflows due to exploitation by external sources and the pressure of an increasing local population have drastically reduced the productive capacity of local environments.

It appears that the only way of initiating a process of environmental reconstruction in our country is to tie the economic interests of local populations to sustainable natural resource management on the principles of local control, equitable distribution and collective responsibility.

## Environmental destruction in the Shiwaliks

The above conclusions are based on the experience gained in the Sukhomajri-Nada watershed development project. Both Sukhomajri and Nada are villages located in the Shiwalik belt. The Shiwaliks are foothills of the Himalaya in North India, stretching west from Nepal to the Pakistan border.

While they had thick virgin forests till the middle of the last century, today the Shiwaliks are amongst the most denuded hills in the country. Human interference in this ecological sub-system began with villagers from the plains being encouraged to settle in the hills by the British. The new settlers cleared vegetation to practice rainfed agriculture and nomadic herdsmen brought their cattle for unrestricted grazing. Tree felling on a large scale was undertaken by the colonial government to meet the growing need of timber for the railways and other urban-industrial enterprises. The combination of clear felling, opening up the forests and unrestricted grazing severely curtailed nature's regenerative capacity.

By the end of the 19th century, vegetative destruction had led to the formation of gullies and once perennial streams being converted into 'chos'. 'Chos' are everwidening riverbeds which now remain dry most of the year but flood suddenly during the monsoons. There are hundreds of chos in the region. Earlier, these were welcomed by farmers in the plains as they brought fertile silt down from the hills. Now they mainly bring down sand and boulders. A region with once perennial water sources is now prone to drought and flash floods.

The problem was recognised fairly early on. In 1902, the Punjab Land Preservation (Chos) Act was passed to prevent further destruction through excessive grazing. But this did not receive social support. Resistance by local people made the government grant them limited grazing and tree cutting rights in areas close to villages. Areas away from habitations were completely closed. But implementation of the Act remained weak and the situation has worsened further since India's independence in 1947.

However, while attempting to restrict grazing, the government continued to treat the remaining vegetative cover as a source for earning revenue. Private contractors continued receiving contracts for cutting timber. Paper mills were given leases to cut bhabbar grass, which is an excellent raw material for making paper, at an extremely concessional rate. Similarly, khair trees were auctioned to outsiders for extracting *katha* which is used for making *paan*. Little effort was made to improve the economy of villages or to solve villagers' problems.

Loss of topsoil due to erosion progressively reduced the productivity of village agriculture. Disappearance of perennial streams created moisture stress depressing crop yields further. The combined pressure of diminishing crops and an increasing population generally produced two responses—it increased the villagers' land hunger and made them resort to keeping more animals to raise supplementary income through sale to the people in the plains. The increased animal population increased grazing pressure on an already destabilised hill system, reducing its vegetative cover still further. And the villagers' land hunger, caused by low yields of their decreasing land holdings, sent them up hill slopes with the plough. Shaving hill slopes of all green cover produced new gullies and fresh soil erosion which often washes away even some of the precious agricultural land during the monsoons.

**Sukhomajri**

Villagers of Sukhomajri were caught in this vicious circle in the mid-1970s when the Central Soil and Water Conservation Research and Training Institute (CSWCRTI) team arrived there searching for the cause of the high sedimentation rate of the recreational lake in Chandigarh. Hills in the vicinity of the village had reached such an acute state of denudation that they were found to be releasing sediment at the rate of 900 tonnes per hectare per year into the lake. Barely 5 per cent of the slopes had any vegetative cover left. Out of 85 ha of hilly area, planting could be considered on only 7 ha. The hills were totally cut up into pieces with tall, bare, vertical walls.

Initial attempts to reduce the rate of soil erosion through technical measures proved unsuccessful due to non-cooperation by the villagers. For the technical measures to be effective, it was necessary that the villagers not only stop grazing their animals in the hills but actively participate in their protection. But the villagers said they could ill-afford to stop grazing as the animals were an essential part of their already fragile subsistence economy. It soon became clear that the real challenge lay in somehow increasing the productivity of the villagers' small land holdings adequately to make them less dependent on overexploiting the hills.

As documented elsewhere, through a slow process of learning, in which the villagers played an active part, the problem was finally solved and the concept of 'social fencing' born. Today, Sukhomajri has three earthen dams built across natural gullies which store rain water which is subsequently available for irrigating their crops. The water is distributed equitably to each family in return for a commitment to protect the hills. Sukhomajri's 'Hill Resource Management Society' distributes the water, maintains the dams and undertakes protection and further development of the hills. The hills have regained a lot of vegetative cover due to grazing being stopped. Goats and low grade cows have been replaced by high milk yielding buffaloes. The village's annual crop and milk production has increased manifold and the earlier destroyers of the hills have become their staunch protectors. Attitudes among officers of Haryana's forest department have undergone a sea change as well. Now it is officially recognised that local villagers can be the only effective protectors of hills but for this, it is essential that they receive a share of the increased production resulting from their efforts. The forest department now sells the contract for grass cutting rights to the village society and in 1986, even the contract for cutting the commercial bhabbar grass was given to the society instead of an outside contractor. The 'social fund' being raised through these activities is available for ploughing back into the hills and for undertaking other socially oriented work.

### Women in Sukhomajri

On the surface, women in Sukhomajri played little overt role in the decision-making underlying the above process. They attended few village meetings and even when they did, they barely opened their mouths. This seems contradictory and ironic given the role they play in the subsistence sector of Sukhomajri's economy. Ultimately, women have probably been the greatest beneficiaries of the project's gains and will probably also be the most active defenders of the environmental changes which have been achieved. This apparently paradoxical situation can only be understood by having a closer look at women's social status and economic role in Sukhomajri's subsistence economy.

Sukhomajri is a village of Gujjars who have traditionally been professional graziers. They abandoned their nomadic life some generations ago and settled down to combine livestock raising with subsistence farming. Sub-division of landholdings of the original settlers through the generations has today made almost all families fall in the category of 'small and marginal' farmers. Rainfed agriculture on decreasing holdings made it more and more difficult for most families to meet their food needs. This led to a division of labour between men and women in which men started going outside the village in search of cash incomes and the women were given almost the entire responsibility for the subsistence economy. This involves taking care of the animals, taking them to the village pond, fetching water for them, cleaning their pens, carrying their dung to storage heaps in the fields, converting the dung into dung cakes and fetching fodder for them from the hills during the dry season. With disappearance of the hills' vegetative cover, fetching fodder became an increasingly arduous task. Women had to spend hours scraping grass with *khurpis* from distant hill locations to collect even one headload.

Men do help out with the animals but with more of their time being spent on daily wage or salaried employment outside the village, they are not available most of the day.

Women's work on the land includes helping with sowing, hoeing, weeding, harvesting, processing the harvested crop and storing it. Men's main agricultural responsibility is ploughing and when any surplus is available, marketing it outside the village. In addition, women carry the traditional burden of child bearing and rearing and cooking for the family.

Given the poor technologies available for the work handled by women, there are extensive demands on their labour and time. Although men are increasingly searching for stable non-agricultural employment, and recent urban-industrial developments in the region are making more opportunities available, psychologically, the subsistence economy continues to provide an important sense of security.

The net result is that the availability of women's labour is jealously guarded for the subsistence sector by severely restricting their mobility and contact with the outside world. They are like a captive labour force trapped in a micro-world of day to day hard labour to extract the maximum output from their natural environment. Many women express the sentiment that they are like the animals and soil that their lives are closely intertwined with. As all activities connected with earning cash incomes (sale of surplus milk or agricultural produce or non-agricultural employment outside the village) are monopolised by men, women have access to cash only through men. If the man or men in the family are prone to drinking or other vices, women can only fall back on the production from the subsistence sector to feed the children. As women have the closest contact with children on a day to day basis, they also experience the trauma of watching the children suffering from close quarters if there is no food available in the house.

Before the Sukhomajri project started making a substantial impact on the village's economy, it was found that many women were suffering from nervous disorders caused by anxiety, probably a consequence of uncertain food production through rainfed agriculture.

Today, with substantial increases in production of food and fodder, both from their fields and the hills, women's workload has definitely increased. There is more work to be done both in the fields and on the improved quality of cattle in the village. But along with this, women's sense of food security has also increased. Given the choice, women would never like reverting to the old situation.

All the monetary benefits resulting from increased production of food crops and milk remain controlled by men. Traditional attitudes have prevented women from challenging this. Now that all animals are almost entirely stall-fed, the work of fodder collection has increased manifold. In this, the main benefit for women has been that due to increased fodder availability from their irrigated fields, they are no longer expected to go searching for fodder in the hills. In the new division of labour, men seem to have accepted the responsibility of bringing additional fodder from the hills.

### Harijan Nada

The situation in the Harijan hamlet of Nada village, where the project was extended in 1981, was somewhat different. All the landowning Harijan families own even smaller holdings than in Sukhomajri and some of the families are completely landless. Social attitudes disapprove of women going to work outside the village but economic compulsions have provided women with greater freedom. There was no major objection to women undertaking cash earning activities within the village and the women were themselves willing to experiment with new vocations. As even the women from landowning families are not over-burdened with agricultural work due to the smallness of holdings, they have been more willing to experiment with raising alternative crops even in the subsistence sector.

**Smokeless chulha: time saving, fuel saving, and healthier.** MADHU SARIN

The first thing the women responded to favourably was planting fruit trees to improve the nutrition available to the children. Today, the hamlet has a wide variety of fruit trees—guava, lemon, and papaya being the predominant ones. Once irrigation from their newly built dam became available, they planted a wide variety of vegetables and laboured hard over them. While most of these are eaten in the village, some surplus is also sold. As a consequence, the nutrition of the hamlet has definitely improved.

As in Sukhomajri, livestock care in Nada is primarily women's responsibility. The main difference is that the Harijans own fewer and poorer quality animals. Even so, acute denudation of the hill behind the hamlet forced women to spend an average of three to four hours collecting one headload of fodder from the hills.

When village meetings were organised to discuss intensive plantation of the hill adjoining the hamlet to raise fuel, fodder and fibre (as a raw material for rope production by women), the Harijan women took an active part in the discussions. Although all the villagers gave an undertaking to stop grazing in the plantation area in return for getting priority rights to the produce, it was women who effectively undertook the protection. As they remain in the hamlet most of the time, they are able to keep a constant eye on the area. And, for them, the stakes in the plantation's success were much higher. It meant getting fodder for the animals from an area much closer by.

The first monsoon after grazing in the area was stopped, saw so much natural regeneration of grass that the women were able to start harvesting the benefits within the first three to four months. Effectively, this reduced their fodder collection time and labour dramatically. Even older women, who were earlier unable to walk long distances in search of scarce grass started being able to bring back small loads.

Ironically, the first major threat to the successful plantation came three years later from none other than the higher caste women from the main village. With the withdrawal of most external support to the project, these women came to claim their share of the increased fodder from an area under the forest department on which traditionally the whole village has had grazing rights. While the men helplessly watched the higher caste women come and cut grass in large numbers, it was the Harijan women who tried to resist the onslaught. They rightly felt outraged to see others coming to harvest the fruit of their labour. And, it was to the women that the restored hillside had brought tangible benefits. Undoubtedly, the higher caste women will similarly protect the hills near their hamlets if those are also restored. Here, the conflict between the women had arisen partly due to caste jealousies and partly because the experimental area of plantation was inadequate for meeting the fodder needs of the entire village.

### The Nada Chulha

It was Harijan Nada's women's concern even with the quality of their domestic environment that led to the birth of the Nada *Chulha* (woodstove). Today, the Nada Chulha design and dissemination system has become an effective means of transferring a technology primarily used by women, to other women through locally trained women.

Although, initially, the *chulha* was developed in response to an expressed desire to remove smoke from the kitchen and also to reduce firewood consumption, working with women in different regions has made it evident that the *chulha* can provide women with a wide range of benefits. What is liked most about the *chulha* tends to differ with region and culture. For example, in Himachal Pradesh women are happiest about smoke removal, cleaner kitchens and pots and reduced cooking time. Cleaner kitchens mean less labour and less scrubbing of pots which hurts the hands. Less water required for washing pots also means fewer trips to the nearest spring to fetch a pot of water. In the hotter plains of Punjab and Haryana, women are happy about being somewhat protected from the fire heat during the long hours of cooking as well as cleaner pots. In Gujarat and Rajasthan, where women wear saris, they say now their saris do not get burnt during cooking and they are happy about time saving and reduced fuel consumption.

More important than the benefits the *chulha* provides to women, learning a new skill has enabled the *chulha mistris* (the women trained to build the Nada *Chulha*) to acquire an improved social status and an increased self confidence. The income earned through *chulha* work has provided them with a certain degree of economic independence. The nature of the work necessitates moving outside the house and interacting with a large number of families in or near their villages. This has increased their

exposure to larger problems faced by women of their communities, and the regular monthly meetings at which progress and problems are reported have started acting as a forum for discussing and articulating problems and issues confronting women in their areas. As most of the *chulha mistris* had to face initial social resistance to work that involved moving outside the house, their having broken through this barrier has made them role models for other local women. Many of the experienced *chulha mistris* have displayed leadership qualities and are willing to organise local women to confront some of the most critical issues facing them.

Working with the local *chulha mistris*, social workers like me have gained a better insight into the specific problems of their regions. No matter whether it is Himachal Pradesh, Haryana, Gujarat or Rajasthan, in the backward rural areas, the prime burden of the subsistence economy rests on women's shoulders. As a healthy subsistence economy necessitates a healthy natural environment, environmental destruction affects women most adversely. For example, the Bicchiwada block of Dungarpur district, Rajasthan, an area of dense mixed forests of teak, tendu and other species till independence, has been converted into a barren region in just four decades. While the loot has been carried away by outsiders, the local population has been left to face the recurring problems of drought, drying wells and springs and hunger and malnutrition. As firewood collection is considered women's work, many women have to walk 12 to 20 kms every alternate day, spending an average of 12 hours on each trip to bring back a headload of firewood. Similarly, with barely a blade of grass visible on vast stretches of land, even small children have to be pressed into service for taking the cattle for grazing to distant places. Ironically, although the soil in parts remains rich enough to produce teak saplings like weeds, the local tribals, known for their cultural respect for nature, have been pushed into a situation where they pull such plants out by their roots. The reason for this is that under existing forest laws, a good stand of trees on even private land can be declared a 'protected forest'. Unable to deal with the unreasonable tyranny of the system, the people prefer keeping their land free of trees rather than face the risk of losing it altogether. This, however, has been a male dominated outlook. When the possibility of raising fuelwood, fodder and other income generating tree crops is discussed with the women, they are more than eager for guidance and support. It is to them that such a prospect is inviting. And if any degree of success is achieved in reestablishing tree crops in the area, it is women who are likely to be their greatest defenders in the future.

One thing seems clear. Restoration of badly damaged environments in our country is not likely to succeed without the active support and participation of the local people. Such participation will be available only if the people are assured a share in the tangible benefits. And, in this process, women, with their lives so intimately linked with the health of the environment, are likely to represent the most constructive and protective force.

**Ganesh Pande:** I was reminded again and again when Madhu was talking about technology, of some 20 years ago when we were renovating our kitchen. In the traditional joint family in which we lived for many generations in Kanpur, food was cooked by sitting on the floor. I bought a table and when my wife came into the kitchen, she found me making tea on the gas stove placed on the table. She did not say anything; she just smiled.

After a week I discovered that the table was out of the kitchen and she was again cooking on the floor. When I enquired, she said, "It is very tiring to cook while standing up." She feels more comfortable sitting because she can take care of the children and she can teach them while cooking. She has to do a lot of other work, besides cooking. So this style was more appropriate for her.

In many families, we find that the modern style of cooking has been adopted—forced on women by their husbands. In many cases, the women have adopted it themselves. This is a question of modernisation—imitative modernisation, whether it is suitable to our lifestyle or not.

We need to think about development in a different way, in terms of what is really needed. The way we are being 'developed' is a very colonial concept. This type of development starts when some people take upon themselves the responsibility of developing others. In the process, we forget that other people have their own perceptions of development. If they are provided the proper atmosphere, they can bring forward their own concepts of development. This is the process which needs to be accelerated.

# Manipur: Disruption of a fragile ecosystem

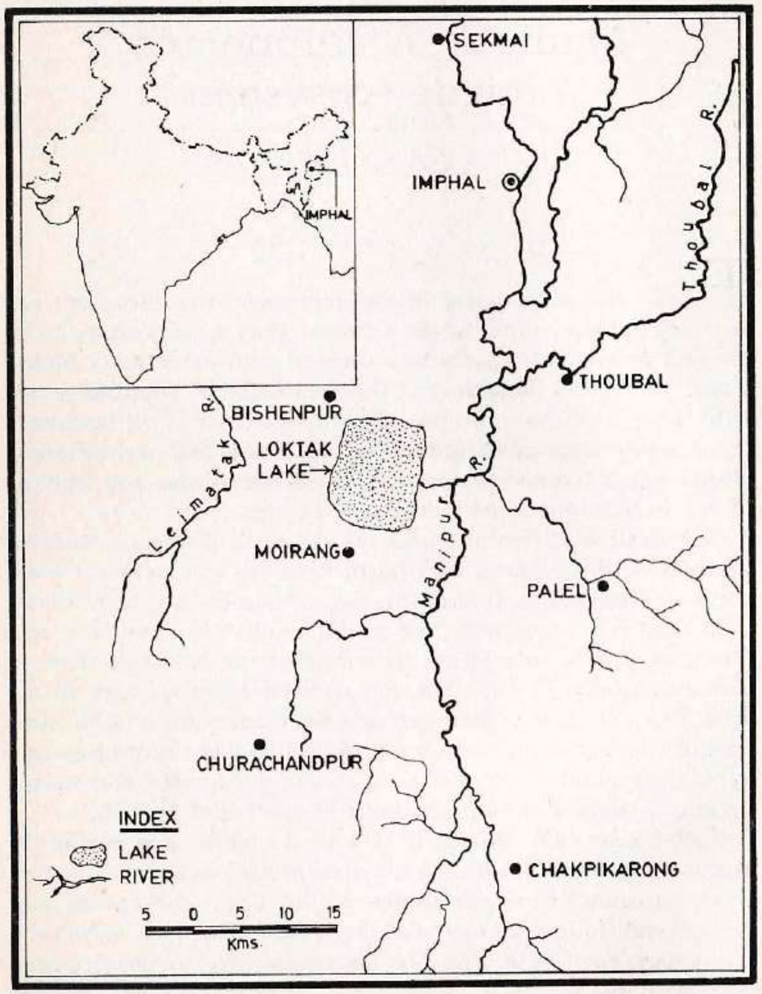
YAMBEM LABA

There are seven states in the Northeast and these are collectively known as the "seven sisters". They are connected with the rest of mainland India by a strip of land barely over 50 km wide, just above Bangladesh. The international boundaries are with China, Burma, Bhutan and Bangladesh. The landmass tapers down from an altitude of around 22,000 feet in the eastern Himalaya in Arunachal Pradesh to 128 feet above sea level at Moreh in Manipur at the Indo-Burma border.

A mosaic of different ethnic groups and cultures is found in the region. But what is significant from the environmentalist's point of view is that it is in this region that the last frontiers of this country's rainforests are to be found and they are fast dwindling. It is interesting to note that the National Remote Sensing Agency Study (1980-82) showed Manipur and Arunachal Pradesh in the Northeast and the Andamans and Nicobar Islands to be the only areas which fulfilled the recommended stipulation of 60 per cent of land area under forest cover in hill regions as laid down by the National Forest Policy in 1952.

Geo-ecologically, Manipur is a land of hills and plains. A bird's eye view of the state would present itself as an oval-shaped valley surrounded by nine ranges of hills. The highest point is at Mt. Isso (altitude 9820 feet) and the lowest at 128 feet at Moreh. The valley itself is at 2591 feet above sea level. The total geographical area is 22,327 sq km. Out of this only 10 per cent (or 2232 sq km) comprises of plains in the Manipur Valley and the remaining 20,000 sq km is occupied by the hill ranges.

There are two river systems in Manipur, that of the Barak



LOKTAK LAKE

river and the Manipur river. The Barak flows westward into Assam and Bangladesh to join the Ganga drainage system winding its way out through the hills. The Manipur river flows through the valley and across to join the Chindwin in Burma to form a part of the Irrawady drainage system. The 'Manipur system' has two sub-systems—those tributaries which discharge directly into the Manipur river and those which first empty into the Loktak lake and are then drained to it. Loktak lake, which covers approximately 200 sq km, is also the biggest freshwater lake in the entire Northeast. These two river systems determine to a large extent the environmental situation of the State.

### The people

Like the geo-ecological division between the hills and the plains, the people can be similarly grouped—those who inhabit the hills and those who live in the plains. Ethnically, all belong to the Tibeto-Burmese stock and Southeast Asian tribes. Out of the total population of 1.42 million (1981), nearly 1.03 million is made up by the Meiteis who are the valley settlers and are largely Hindu by religion.

The hill areas are inhabited by the remaining 0.39 million people belonging to 29 different Scheduled Tribes under the Indian constitution. The tribals are classified into two broad groups—the Naga and the Kuki group of tribes which are mostly Christian by faith.

The uneven demographic distribution has resulted in a very high population density of about 426 people per sq km in the valley and a low of 16 people per sq km in the hill region. It will be clear from these different ratios that all the forest areas are confined to the hills and the tribals by legislation are the actual owners of these forests.

The Naga tribes are by tradition community oriented. They have a traditional village council which takes important decisions over both major and minor forest produce, including timber extraction, and over areas of the forest to be cleared for *jhum* cultivation. The Kukis on the other hand follow a quasi-monarchical system with the villagers owing their allegiance to the chief. The chieftainship is hereditary and has a near monopolistic right over the forest and its produce.

### Legislation

If we add to the geo-ecological division and the ethnic divide, the administrative dichotomy drawn on similar lines, namely hills and plains, we will be able to get a clear picture of Manipur.

This dichotomy began with the British occupation of the state in 1891. While converting Manipur into an Indian princely state, the British retained much of the administrative control. Alongwith their occupation, the system of collecting revenue from the hill areas in the form of 'house tax' at the rate of Rs. 3 per household per year was introduced. After independence and Manipur's merger with the Indian Union in 1949, two new Acts were introduced. The first was the Manipur Hill Village Authority Act, 1956 and the second was the Manipur (Hill Areas) District Council Act, 1971. The colonial legacy of 'house tax' was retained but the rate was raised to Rs. 6.

For the plains a different legislation, namely the Manipur Land Regulations and Land Reforms Act, 1962 was introduced. The marked difference that came to be a permanent landmark, was that while the legislation in the plains allowed all citizens of the country to buy land and settle down in the valley area with a mere 10 per cent of the total geographical area of Manipur, the remaining 90 per cent area of Manipur became the exclusive preserve of the tribal people. So while it is possible for the tribal people to leave the hills and settle in the valley which they often do, the plains people are not permitted by legislation to settle in the hills.

Each tribal village has its own well-defined boundaries. All the resources in that area, namely the forest and its produce, become the property of the village. If it is a Naga village, the community has a greater say in its distribution and if it is a Kuki village, the Chief has a near monopolistic right. In both cases, the chief becomes the ex-officio chairman of the Village Authority.

### Forest

The first point to be noted when we talk about the forests of Manipur is that they are physically confined to the hills. However, when the environmental problems arise resulting from the loss of forest cover, the major impact is felt by the valley and its people. The valley besides being densely populated also serves as the 'rice bowl' of the essentially agrarian Manipur economy. Its backwardness is also reflected by its low per capita income which is only Rs. 1673 at 1983-84 prices, lower than the national average.

The forests of Manipur are grouped under three categories:-

i) Reserved forest—These are areas which are the sole property of the state under the Indian Forest Act, 1947.

ii) Protected forest—In these forests, the rights of the people over the forest and its produce have been protected.

iii) Unclassified forest—These are forests over which the government lays no claim.

The total area of reserved forest has been estimated at 1,377 sq km while that of the protected forest at 4,171 sq km. It is, however, the unclassified forest area with 9,606 sq km that forms the largest portion. The total forest area adds up to 15,154 sq km which is 67.8 per cent of the total geographical area. State forest authorities while giving figures of annual timber extraction and loss due to jhuming, which alone accounts for 900 sq km of forest area annually, ironically insist that this figure of 67.8 per cent has remained unchanged for the last ten years. This is also in contrast to the National Remote Sensing Agency findings which indicated that the forest area has reduced between 1972 and 1982. What has not been disclosed is the density of the forest cover.

Before we get to the extent of destruction, it would be worthwhile to identify the actual owners of the forests. The state forest department officials assert that they actually own and control only the reserved forest areas which account for a mere 9 per cent of the total forest area. The unclassified forest areas which account for 63 per cent of the total forest area of the state come under the purview of the Manipur (Hill Areas) District Council Act, 1971 and not under the Indian Forest Act, 1947. Of the remaining 28 per cent area occupied by protected forests, the state forest officials admit that while they are the *de jure* owners, the *de facto* control is in the hands of the tribal community. They further argue that any discussion on the subject of forests, and management by the state forest department should necessarily be limited to the 9 per cent reserved forest area under their actual control. Thus, Manipur has a unique situation where in 91 per cent of the total forest area, no national or state policy can apply and its fate is left to the dictates of the law of demand and supply of the major timber marketing centres of the country. If to this we add the unscrupulous nature of timber traders, the fate of the environment can easily be imagined.

### Pattern of destruction

Besides an air link, Manipur is connected to the rest of the world by two roads. The first is the National Highway No. 39 via

Nagaland and the second is the National Highway No. 57 via Cachar District in Assam. Any traveller on these two highways will notice that there are no forests left on either side. To get an idea of the pattern of destruction, all one needs to do is to examine the road map of Manipur. Axiomatically, it can be concluded that there will be no forest left along the routes and their hinterlands. Where no motor vehicle can ply, buffaloes are employed to drag down the logs like a sledge to the nearest motorable point.

The traveller on the second National Higheway will, however, notice that much of the western region is covered with bamboo groves. Since bamboo is a secondary growth, it is clear that the destruction there had occurred fairly early. Once an area is under bamboo, there is little chance of regeneration of trees because the soil soon gets enmeshed with bamboo roots. In fact, the destruction of forests took place over 40 years ago, between the advent of the British in 1891 and the transfer of the area from the jurisdiction of the Assam forest department to the Manipur authorities in 1931. Commercial exploitation of the bamboo plants for housing and fencing has picked up over the years. This area is also expected to supply raw material to the public sector paper plant coming up in neighbouring Cachar district of Assam.

The forest department annually auctions felling rights of *mahals* in the reserved forest areas under its control. The term *mahal* was coined by D.C. Keith of the Assam forest department, when he was on deputation to Manipur in 1932. He divided the forest area in the Iril-Barau drainage block into 19 working units, each called a *mahal,* with its own marked boundary. All the *mahals* are to be found in the unclassified forest area of Manipur. Every year the monopoly right to work a *mahai* is auctioned. The person who is given this temporary right—the *mahaldar*—is supposed to work within a strict framework of rules but these are generally ignored. Basically, a *mahaldar* is a timber merchant with a monopoly right over felling and extracting trees. It goes to the credit of a teak *mahaldar* from Calcutta, in league with local authorities, that the last of the naturally grown teak in Manipur has been removed. The teak that comes into Manipur and later finds its way into major Indian markets, is smuggled in from Burma.

### Free sale timber

According to the rules, any tribal can fell trees for his own use without permission from the forest department. However, if it is meant for sale, then prior permission and royalty must be paid. In practice these rules are neither followed nor enforced.

A significant indicator of the super-profits earned are the roads which are constructed by the timber merchants to facilitate timber extractions. This also gives some false sense of ushering in development with the merchants as the benefactors of the tribals. The merchants are either the plainspeople (Meiteis) or North Indians (*Marwaris*) and a few tribal millionaires. The latter two groups cater mostly to the demands of the major Indian cities like Calcutta, Delhi and Madras.

The purchase is made directly at the village from the tribals. In case of Kuki tribes, the negotiations are mostly carried out with the chief by virtue of his near monopolistic rights over the resources of his village. In the case of Naga tribes, the payment is made to the village authority or to individuals who had earlier been sanctioned rights by the village authority. Often enterprising tribals will act as middlemen between the village authority and the merchants. Having collected the timber, the merchant will now pay the forest official at the toll gate the due royalty without any insistence for producing documents or any official paper.

It is this loophole of non-insistence of producing documents for timber movement that has literally opened the floodgates for free sale timber from Manipur to the major Indian markets. A log of timber which costs Rs. 40 per cu ft in the valley might originally have been bought for Rs. 20 per cu ft in the hills but by the time it reaches Calcutta or Madras it will readily fetch Rs. 350 per cu ft.

The volume of timber extraction can also be looked at from the point of view of the number of power-driven saw mills that have sprouted in the valley. In 1970, there were only five such mills; by 1980 they had increased five-fold; and, by 1985 they had reached a staggering number of 118 mills. What is even more interesting is that there is no coordination whatsoever between the directorate of industries which grants these licences and the forest department. Between 1980-81 and 1982-83, 1,44,000 cubic metres of fuelwood were extracted, and 12,35,400 cubic metres of roundwood.

### Loss due to jhuming

It has been estimated that around seven out of every ten tribal cultivators in the hills are wholly or partially engaged in *jhum* or slash and burn cultivation, also known as shifting cultivation. While an official report on "Forest and Tribals in India" put the area under *jhum* in Manipur at 832 sq km per year in 1982, state forest officials estimated it at 900 sq km per year by 1985-86. The increase in *jhuming* or the area of forest destroyed for it, should be seen in combination with the shortening of the *jhum* cycle from six to seven years a decade ago, to about two to three years presently. It means that the *jhum* patch has to be abandoned after two to three years and new forest areas have to be destroyed, through slash and burn. Further, since the burning operations are uncontrolled, more forest areas are destroyed than is actually needed for *jhum*. After the burning is over, the area is then cleared of all shrubs and trees and crops planted. In some areas where there are no more forests left, the tribals are forced to resort to uprooting the roots and stumps to sow the crops. This has led not only to soil infertility but the soil having had its last protection removed, is now exposed to soil erosion.

On paper, Manipur has about 63 per cent of the land under forest which conforms to the national minimum requirement. But the question is how much of this is really forest now. From my experience of travels in hills— and I have trekked at least 1,500 km along both charted and uncharted routes—the answer to the query would be 'very little'. Reserved forest areas would contain maybe a dozen trees over a 40 sq km tract. As mentioned earlier, where there are roads there are no forests. This is true not only for Manipur but for the rest of the six sister states of Assam, Arunachal Pradesh, Meghalaya, Mizoram, Tripura and Nagaland. In an area where development has been slow due to neglect by the centre, it is ironic that roads lead to destruction and not development.

### The consequences

The impact of the deforestation has been felt over the years and now more prominently through the river network systems and their reservoirs, the *'pats'* or lakes. Besides the 'Loktak *Pat*' which extends over 246 sq km, there are 22 other *pats* totalling 196 sq km. Top soil erosion in the deforested and now exposed catchment areas had resulted in high siltation when these *pats* stored up the excess water during the monsoons. By 1986 it was evident that at least 13 of these *pats* had dried up and been reclaimed for cultivation and settlement. As a result, the pressure on the remaining *pats* has increased.

With smaller reservoirs to drain the excess water coupled with shallower river beds and a lower water table, the ten year flood cycle has now drastically been reduced to an annual feature since 1984. In 1985, the Governor's residence was flooded and in 1986, the Chief Secretary's house met with a similar fate. If these 'high spots' in the valley are vulnerable to floods, the plight of the common person can well be visualised.

In terms of the extent of damage, the 1986 floods destroyed standing crops spread over 41,000 ha, worth Rs.32 crores. Some 323 villages were inundated affecting over six lakh people. About 9,325 houses were either damaged or submerged. Damages to river embankments, bridges and roads were estimated at Rs. 45 crores. About 29,000 head of cattle and birds were destroyed. This loss, when seen in the light of the meagre Rs. 25 crores which is Manipur's own domestic contribution annually to the planning process, brings to light the extent of havoc deforestation has started playing in a poor state like Manipur.

What is also interesting is that the 1986 floods came in the month of October which had received only 171 mm of rainfall compared with 225 mm, 231 mm and 205 mm in the preceeding months of June, July and August. Till September, the state government was pleading with the centre to have Manipur declared a drought-stricken State. In fact the centre's drought survey team was about to board a plane in Delhi for Manipur when it was informed that the area was flooded. The October rains flooded all the rivers, breaching embankments at 84 places and overflowing the banks at 232 sites. Very few places in this country have seen instances like this where droughts and floods follow each other within a span of four months. To add fuel to the fire, landslips occurred on both the national highways cutting Manipur off from the rest of the world. Essential supplies to the marooned people were cut off and hoarding was rife. The price of potatoes soared to Rs. 10 per kg while rice reached Rs. 8 per kg.

### Endangered Loktak lake

Continuous siltation is posing a threat to the Loktak lake. The Loktak, besides providing 60 per cent of the total fish catch in Manipur, is also the site of the controversial 105 mw hydroelectic project. During the drought period in 1986, power production had to be drastically reduced due to the lean flow in the feeder channel. Although it was for a brief period, a warning has been issued that the Loktak may one day dry up.

The other distinctive feature of the Loktak is the floating swamp locally called *phumdi*. It is on these *phumdis* that the world's rarest deer, the Sangai or Brow Antlered deer (*Cervus eldi eldi*) is found. Reclamation of land during the dry season by erecting embankments when the *phumdi* rests on the ground, and cutting off the water have drastically reduced the habitat of the Sangai. Today they are confined to a mere 40 sq km wildlife sanctuary at Keibul Lamjao. The number of Sangais have increased from a precarious 14 in 1975 to 95 in 1986.

### Wildlife

The loss of forest cover has also sounded the death knell of wildlife in general. The authorities say that although their jurisdiction covers the entire state, their actual control is limited to the 40 sq km wildlife sanctuary at Keibul Lamjao and the 1 sq km area of the Manipur Zoological Garden at Iroisemba. Although the Manipur Wildlife (Protection) Rules, 1974, have been enacted, they have never been enforced. What has actually happened is that traditional tribal hunting rites and games are now done with the help of guns and rifles. The rites would demand that if a deer is bagged with the help of a borrowed gun, then one thigh of the animal must be given to the owner of the gun. Hunting is not limited to tribals but both uniformed and out of uniform government officials participate.

The loss of habitat coupled with the use of modern firearms have led to the extinction of a few species. The tiger is no longer found in Manipur and the clouded leopard and the golden cat have disappeared too. The contribution of the Calcutta-based teak *mahaldar* in clearing the last of the naturally grown teak trees in Manipur, as mentioned earlier, has also simultaneously ensured the departure of wild elephants that once used to abound the teak forests. An enthusiastic member of the Indian Administrative Service also contributed over the years to the dwindling count of the winter birds that used to flock the Loktak lake during the winters. He had been shooting the birds down without fail for the last 20 years. Flocks of parakeets that used to arrive in the valley to herald the coming of winter are no longer visible.

Amongst the endangered birds are Hume's Bar Tailed Pheasant, the King Hornbill and Blyth's Tragopan. The streams in the hills that were once filled with fish have seen the wanton destruction caused by dynamite fishing. For every ten fish recovered in such dynamiting, at least a thousand more are killed.

### Preventive measures or solutions

Preventive measures to stop further degradation of the environment have been two-fold. The first is the settlement of the *jhumias* through settled agriculture on terraced fields and horticulture. The second is checking soil erosion through afforestation. Efforts have been made to make the tribals grow yam, tapioca, sweet potato and quick growing bamboo. A total of Rs. 277 lakh have been earmarked for the Seventh Plan period (1985-90). Horticulture has been promoted with even greater emphasis. Orchards and vegetable gardens have been alloted Rs. 645 lakh in the Seventh Plan. For soil conservation through afforestation, Rs. 333 lakh have been allocated.

It is clear at least on paper that the state government is aware of the environmental problems resulting from the loss of forest cover. But there is no state environmental board to guide the government on environmental issues. This would perhaps explain the lifting of a brief ban on timber movement outside the state recently. Plan documents make nice readings but the question is whether implementation is sincere. My personal experience through extensive treks in the hills rings a pessimistic note. One common feature of all tribal villages as one moves away from the district headquarters is the diminishing presence of state administration. Schools without teachers and benches, dispensaries with no staff and medicines, uncompleted roads and half completed bridges mark the trail.

There is also the immediate question of how to stop the trees from being cut. Any legislation is bound to be interpreted as encroachment on traditional tribal rights while a complete ban on *jhuming* would mean starvation for the tribals. There is an urgent need to arrive at a law or policy whereby at least the catchment areas are brought under a tree sanctuary scheme.

The forest department will also do well to realise that rules have been framed to be followed and not to be flouted. The day they start insisting on prior permission and royalty for timber meant for commercial purposes and refusal to recognise the timber merchant as the *de facto* spokesman for the tribal timber seller, the process of curtailing the rate of deforestation will be initiated. There is an urgent need to apprise the forest officials that their action in implementing the rules will mean saving the future. One gets the feeling that many of them view the forest department as another employment agency with the unscrupulous ones out to make a fast buck. This awareness needs to be created at the top policymaking level, too. There is an even greater need to look upon the people as the solution and not the problem. The task is to make environment a people's movement everywhere. Discussions on environment should not be confined to urban areas and its intellectuals but should be held in the tribal villages themselves. While it will not be possible to have a hundred Chandi Prasad Bhatts to start a Chipko Movement, it will definitely be possible to have at least a thousand ecodevelopment and awareness camps annually. The question is who will do it. It is here that the voluntary agencies should be brought in and their help sought.

There is also an immediate need to identify alternative sources of fuel. The Loktak hydroelectric project should be made use of to the fullest. This project generates a total of 105 mw of power whereas the peak consumption of the state does not exceed 20 mw. Electrification of the villages and the promotion of using electricity for cooking purposes will definitely be cheaper both economically and environmentally. The bulk of the people still depend on fuelwood for cooking and LPG connections are a far cry for most

General awareness about the environment is slowly being roused. But environmental problems come in like cancer. They grow silently and worsen with time. Let us save the situation before it is too late.

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# Murder by poisoning: Death of the Palar

NARAYANA MURTHY

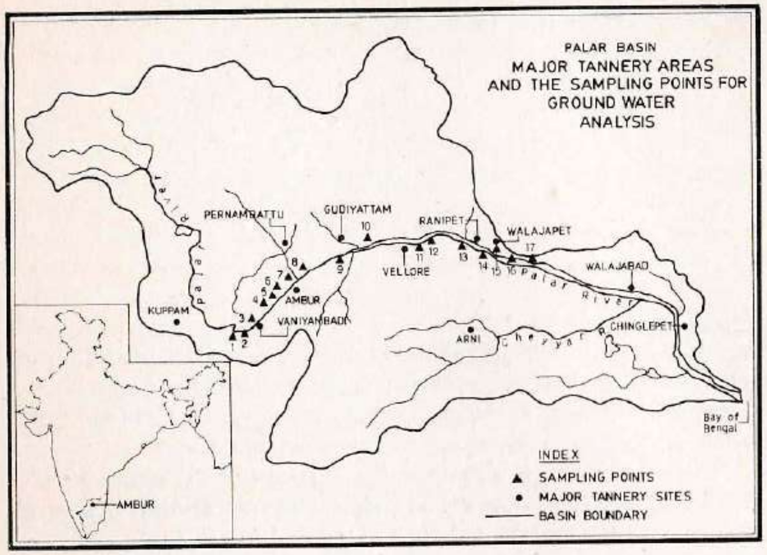
Environmental degradation is not a problem that concerns nature. It is a human problem. It is a problem because certain people benefit tangibly from it and other people suffer silently because of social, economic and cultural inequality.

The case study presented here is typical in the sense that it highlights how environmental degradation invariably results in the poor suffering the most. The problem has been growing exponentially and unchecked and the stage is set for the worst to happen.

'Smoke is the sign of development', some say. 'Development without industry is impossible', claim others. We have witnessed how ill-planned, exploitative development, with only smoke above, can ruin not only the environment—natural resources, forests and fisheries—but also a vast number of people and their cultures.

I am refering to the leather industry in India and, in particular, its erratic growth in Tamil Nadu, its impact on environment and adverse influence over people's subsistence. In India, tanning of leather dates back to ancient times. The art of making leather has existed since 400 BC. In the beginning of the 1st century, Manu deemed that the duty of skinning dead animals was that of the herder. It was after 1200 AD, when intellectual indolence crept into society, that orthodoxy shifted the responsibility from society as a whole to the 'children of no man', namely, Harijans.

The art of making leather attracted scientific thinking and application only by the end of the 18th century. The industry switched from the hands of Harijans—it was then a handicraft—



**Groundwater Quality in Palar Basin**

| Sampling Point ▲ | Total Dissolved solids mg/litre | Sampling Point ▲ | Total Dissolved solids mg/litre |
|---|---|---|---|
| 1 | 540 | 10 | 565 |
| 2 | 530 | 11 | 480 |
| 3 | 5350 | 12 | 725 |
| 4 | 2065 | 13 | 655 |
| 5 | 2490 | 14 | 450 |
| 6 | 1200 | 15 | 580 |
| 7 | 3710 | 16 | 445 |
| 8 | 1255 | 17 | 430 |
| 9 | 745 | | |

(Source: TWAD Board, 1983)

to rich Muslim merchants who saw great potential in the product. This was accentuated by the British rulers who valued leather goods not only as clothing but also for their military.

The British brought in scientific, mass scale production of leather in the early 1900s, which they called the East India tanning process (EIP), a name which continues till today. The impact of the improved techniques did not reach the Indian cottage tanners (*chamars*) and their ignorance and limited resources cut them off from 'development'. For centuries, the cottage tanners have been exploited by the rich merchants.

Before the mechanisation of leather tanning, the village communities with their cottage industries had a balanced socio-economic structure and lived in amity. The resources and raw materials were utilised with utmost ecological conscience, without troubling the communities. But when the 'scientific' wave swept over them, they had no other option except to cease production. In Tamil Nadu alone, nearly 16,000 cottage tanners were stripped of their profession and reduced to the level of social refugees.

In the army camps of Kanpur and Agra, mechanised tanneries produced saddlery and shoes. A large portion of the leather used to be exported raw or semiprocessed to Britain from Madras under the name of EI Kips even during the 1930s.

Even though the EI tanning process displaced the cottage tanneries, it was not as dangerous as the chrome tanning process which was introduced in the early 1960s. EI tanning required only natural materials like vegetable oils, bark and wood extracts. The abundant supply of raw hides and skins and natural tanning materials from the forests were instrumental for the growth of this industry. The disposal of the waste effluent was very easy as industries located themselves near waterways which not only gave them access to water supply but also served to dispose of the effluent in running water.

But the situation has been quite different in Tamil Nadu from other tanning zones in India. Leather produced in Tamil Nadu has always been of high quality and only for export. The first ever mechanised tannery was set up in Tamil Nadu and more precisely in Ambur, in the 1930s. Later there was a heavy concentration of the industry, possibly because of natural conditions like prevalence of a sunny climate all through the year without much variation (which is very good for tanning), local availability of tanning materials like myrobalan, bark and wattle, strong technical backing from the British, cheap labour and abundant availability of chloride free water from the Palar river.

Palar, one of the 17 main rivers in Tamil Nadu, used to flow freely three or four decades ago and, as in other tannery zones of India, the river was 'colonised' by the leather industry on both its banks. Incidentally, the last time the Palar flooded was in 1972. It is now too choked to ever have enough water to flood.

The Palar originates in Karnataka, flows through North Arcot and Chingleput districts and joins the Bay of Bengal near Madras. To be more precise, it enters North Arcot district near Vaniyambadi town and travels all along the district. Let us study the concentration of the leather industry on both the banks of the Palar from Vaniyambadi upto Ranipet, a stretch of 100 km. When these industries were located in the early 1930s, Palar supplied chloride free water, the nearby Javadi Hills supplied raw materials for tanning, and hides and skins were locally available. The only labour force available was in farming. North Arcot boasted of good agricultural productivity those days, but land was available at a throwaway price.

The first few leather units bought a vast stretch of land. Effluents were let out in small pits on their land. Production was very small and the quantity of effluent low. Farming communities believed that the effluent—which contained vegetable extracts—was good manure and, in fact, a lot of small farmers wished to be near the factories to utilise the effluent for irrigation. Villagers used to carry away the effluent to recover the lime in it for housing.

Encouraged by this attitude of villagers, the tanners gained confidence to buy up village land for further expansion. More land was bought and more industries came up. This went on till the late 1950s, when the industry suffered a setback. The vegetable and wood barks from the Javadi hills vanished. The tanners were baffled. Resources from other parts of the country were mobilised—from Orissa's forests, for example—but then the transport costs and interstate transport regulations left the tanners no option except to go in for alternative methods of tanning.

The central and state governments, which were keen on industrial development, were closely watching the growth of the leather industry. Since this industry generated a lot of exports, taking a cue from the British, the governments wanted to help this industry out of its crisis. By the end of the 1950s, Tamil Nadu

already housed 300 tanneries, of which 250 were in the Ambur-Vaniyambadi belt. In the early 1960s the central government instituted a leather research centre to find out alternative technologies to process the leather. The Central Leather Research Institute (CLRI) in Madras, came out with the process using heavy metals like chromium, and a tannery in Ambur, with British collaboration, adopted chrome tanning. The results were overwhelming.

If EI tanning took 18 days, chrome took only 24 hours. The quality of leather was amazing and there was a sudden boost in the market. Several leather units in the area followed suit and before the end of the 1960s, most of the tanneries were using this process.

But the implications of the change in this industry were not understood by the farming community, which still irrigated with tannery effluents and allowed the tanners to buy land. Yet more industries sprang up and the government, all set for a big export boost, announced incentives and subsidies.

A hundred more industries were added. By the early 1970s, a few giants had monopolised the market. Things continued without much problem until one day an unfortunate farmer, to his dismay, found that all his crops had died. He thought it was mischief by the village gods and offered animal sacrifices. Soon, many other farmers witnessed their crops dying before their very eyes. The chrome and other chemicals had done the first damage. But by then the industry was all set for a big takeoff. Too much money had already been invested; the poor farmers had no say.

One factor which differentiates this problem from others in India is communal. The companies are completely monopolised by the Muslims and the people affected are mostly Hindus. Whenever Hindus try to raise this problem of pollution, it is always seen as a communal problem.

But now the industries came to the 'rescue' of the farmers. The tanners came up with a two-point proposal:

1) To buy the unproductive lands at exorbitant prices; and,
2) To employ the farmer whose land was purchased.

Pacified, the ignorant farmer was forced to be silent and content. In villages in our area, farmers commonly constitute a mere 20 per cent of the population and when they face a problem, the rest do not care. The tanners, emboldened by the passivity of the population, started openly blackmailing the farmers. The factories built on unproductive lands discharged more effluent into the nearby productive lands, making then unproductive over a period of time. The powerful tanners in no time ammassed an enormous amount of land.

But conditions changed gradually. The monsoons failed and the Palar was no more a flowing river, though it supplied underground water abundantly. The tanners started facing problems in purchase of lands convenient to them and the effluents were too much to store in the vacant lands. A few farmers, realising the danger, protested mildly, and went to court claiming damages. The tanners cunningly resolved to dump the effluents into no man's property—the Palar river.

All the 300 odd tanneries started discharging their effluent into the river. The dry river consumed all the effluents without resistance. If you see it today, it is bright with various colours.

Within two years, this had an adverse effect on the underground water. Water from the wells on the banks of the Palar turned undrinkable and crept into surrounding villages. This time, the victims were women. The common wells which used to supply potable water turned undrinkable. The women and children had no option but to scrounge for drinking water wherever it was available, however far.

According to government sources, in Vaniyambadi *taluk* (133 villages) the number of tanneries increased from 108 in the 1960s to 240 in 1975. In the same period the number of farming families dropped from 23,000 to a mere 8,400. Leather exports increased from Rs. 30 crore to Rs. 248 crore. The number of tannery workers increased from 4,000 to 9,000. Production of paddy, sugar and groundnut decreased to an unbelievable 22 per cent of the total agricultural produce.

The land rendered unfit for use increased from 240 ha to 6400 ha, polluted wells in the villages rose from 48 to 520; the distance women had to walk for water increased from 1 km to 5 km every day; and, the chemicals used for tanning rose from 42 to 276, which includes 13 heavy metals, apart from other toxic substances.

The silent agony continued. Women started walking several kilometers in search of a pot of potable water. Children were pressed into service to fetch water. Once the tanners established themselves comfortably, several things followed. The government, by way of encouraging the trade, allowed only the export of finished leather. This was also in accordance with the Stockholm Conference on Human Environment held in 1972 and most leather industries in Europe faced closure due to their pollution. The European factories then approached the Indian government to collaborate. Bilateral trade relations were encouraged. Several European countries were allowed to invest money, supply machinery and chemicals and take back the finished leather. Leather became one of the top three export-oriented items in the country and production was geared up to meet world demand.

By the 1980s, North Arcot district, with 400 leather units out of 550 in Tamil Nadu, and producing 80 per cent of the country's leather, became a 'dollar district' and more and more subsidies were pumped into the industry. A Leather Development Board owned by the state government was set up. Leather became an attractive item with the government. This subsequently led to political influence and tanners themselves became politicians. Meanwhile, Ambur, with a floating population of nearly 0.1 million and the heart of the trade, suffered for want of drinking water.

The water system, which cost Rs. 50 lakh in 1965, supplying nearly 48 lakh litres of drinking water a day, was declared unfit for human consumption by the Tamil Nadu Directorate of Public Health and Preventive Medicine in Madras. Fear swept over the town and the struggle for getting drinking water moved from the villages to the towns.

By 1984, the number of polluted wells increased to 10,000 in the 200 villages and yet more people walked ever-lengthening distances for water. It was common to see women scouring the streets for water even in the dead of night. There were reports of drinking water getting stolen from houses. People became anxious. Initially, the state government did not accept that there was serious water pollution in Ambur. "Pollution? What? In India? You mean like in Western countries?"—they ridiculed people when approached for help.

There was yet another problem. The farmers-turned-workers in the tanneries were forced to work with toxic chemicals with no protection. The women remove the hair from the hides by using sodium sulphite. Skin rash is rampant. In the late 1970s, a batch of these workers protested against the cruel working conditions. Around 5,000 workers were thrown out of the tanneries without any reason.

These unfortunate people, who once owned small plots and currently had no jobs, became social outcasts and were put under terrible stress. By then the tanners had entwined themselves with village politics so well that whatever they said was law. These former farm hands had no other option than to take up wood cutting from whatever forests remained on the Javadi hills. Some of them migrated to other places. According to our study, nearly 2,000 families have taken up wood cutting as their profession and are surviving on it now. Tanners secured more silent workers from other districts, in place of those displaced. The area, thus, witnessed a chain of environmental problems with many diverse links.

Today the situation is almost catastrophic. The Tamil Nadu Pollution Control Board, which was set up in 1982, could not do much more than send notices to the tanneries to stop pollution. The time limits given to them to instal effluent treatment plants have been extended as many as 15 times because of strong political lobbying. But nature, when tampered with beyond limits, spares no one. Now the tanneries have started feeling the pinch of pollution. They have extracted unlimited supplies of water and returned untreated toxic effluents to the river. The river bed is severely polluted for 100 km and the tanners find it extremely difficult to get chloride free, unpolluted water for their process. They are baffled by the speed with which nature has reacted.

When pressed to adopt pollution control, the tanners have threatened to close down the tanneries, because they cannot 'afford' to instal sophisticated control equipment. But soon they will be forced to close down for want of water. They also complain about the lack of appropriate technology for treating the effluent but whenever methods are suggested, they claim lack of funds. They also feel that it is the government's duty to clean the polluted water as the government benefits from the foreign exchange earned by the industry.

The current situation in Ambur is assuming alarming proportions. Last year, 29 people died due to a cholera epidemic, caused by contaminated water; skin infections and gastroenteritis are extremely common. The contaminated water has become a breeding centre for amoebiasis and giardiasis dysentery and milk diarrhoea. In 1985, a test conducted by our medical wing revealed that all 600 tannery workers examined had a zero sperm count!

As there is no indepth study of the impact of pollution on the health of the people, we do not know the exact dimensions of the

problem. The pollution load is getting bigger every day as the tanneries are forced to use substandard water which needs to be neutralised with several chemicals. The biological oxygen demand (BOD) level in the polluted water has already crossed 20,000 mg per litre, when the safe limit for drinking is 3 mg per litre.

The government has failed in its duty in several ways. It has encouraged an industry which was ill-planned right from the start, without considering the environmental impact; instead it continues to encourage this industry for the sheer income it generates as foreign exchange. The unfortunate 15,000 small farmers have not been given any sort of compensation. Alternative arrangements for drinking water have not been given. Above all, an industry which has become so very important is going to consume itself and die soon, unless its pollution is stopped.

No industry is without pollution, but pollution can be weighed against the benefits to the local people. The leather industry in Ambur, does not cater to the needs of the local people and yet they are forced to bear the cost. It may be easy to close down the factories but what will happen to the 0.5 million local people who are being forced to drink polluted water and are suffering from known and unknown health disorders? What will happen to the 62,000 workers employed in these industries? What will happen to the polluted land, water and rivers? What about the ancillary industries? These questions are at the moment unanswered and perhaps may not be answered.

Ours is the only action research group in the whole of Tamil Nadu which has been spearheading the fight against pollution and social injustice for the last six years. I do not say our efforts are without result. After two years of formal studies and understanding the gravity of the situation, we sprang into action in 1984, mobilising all the affected people for joint action. We went around the villages, explained the situation, convinced them of the need and power of the people's force and in the following years, organised a series of dharnas and demonstrations.

It is worth mentioning a protest march in which 20,000 people, all villagers—farmers, women and children—participated. Women carried pots of polluted drinking water and broke them before the municipal authorities, demanding clean water. This got the immediate attention of the government. There was an adhoc arrangement made to supply water from the Jawadi hill valleys which are protected from pollution. But this did not affect the attitude of the tanners.

In mid-86, we organised a state level seminar to which we invited social activists, rural development groups working in tannery zones in Tamil Nadu, farmers, women and the tanners themselves. No representative from the government turned up, inspite of our desperate attempts. To our surprise, 37 groups, 40 individuals and 49 tanners from all over Tamil Nadu participated. This was the first time a common platform was provided and after a heated argument, the seminar came out with a package of recommendations.

A district level pollution monitoring committee has been set up in which there will be representatives from our group, women, farmers, tanners, sociologists, technologists and environmentalists. The committee will go into the problems faced by the people, industries and the government in tackling the pollution, suggest plans, look into the technical aspects of treatment plants and feasibility, and expedite the process of installation and monitoring. The committee can visit any tannery at any time. It sounds impressive, but it could be a trap to silence us. Even if we come up with a proposal for pollution control, there is no guarantee it will be implemented.

It will also have to mention what we have not been able to do. One, we have not been able to get support from like-minded people not only in Tamil Nadu but also in other parts of India, to launch joint action. Two, we still have to conduct a deeper study of the impact of pollution, especially on the soil and crops.

Keeping this problem in mind, we have been making several efforts to attack the problem from various fronts. We have organised farmers, tannery workers, wood cutters and women through training and ecodevelopment camps, bringing together all the effected people, forcing the tanners and the government to face reality. We have been contemplating exposing this international game to the buyers of leather in the US, Europe and southeast Asian countries to pressurise the tanners to go in for effluent treatment.

Maybe we are already late. But how do we really stop catastrophes?

**Agarwal:** I think we should talk about how the various groups in this country can collaborate with each other on environmental

pollution and what kind of programmes we could take up.

**Prasad:** I would like to comment on tannery pollution in Ambur. Why are we not trying the Supreme Court? Nani should immediately send a petition to the Supreme Court giving all the details so that it can charge the factories under Article 51A of the Constitution. Your local standing will not be questioned because every citizen has a right and duty to protect the environment. You can claim that you should be allowed to discharge your duty. So ask the judges to issue a writ of damage, directing the factories to clean up their effluents.

We want all factories to work, we want maximum productivity but we also want a clean environment. I do not know why you have been fighting shy of going to court to penalise the pollution control board which is statutorily required to discharge its duty and which it is not doing. Your *dharnas* and shouting will not help.

I also suggest that there should be a pollution study network so that all the experiences we have gained so far can be pooled. We should form a committee to extend all possible help to local struggles like this.

**Nani:** We are working on a Supreme Court writ. It got delayed because we got bogged down with some lawyers in Madras. The papers are almost ready.

**Hiremath:** This idea of anti-pollution groups coming together is very important. We find that when we took up these two cases, a lot of the mistakes were avoided primarily because we went to places where prople have already been in similar situations. Of course, we have to evolve things that suit our own situations.

In the case of Ambur, it is very important to have a small team of scientists, especially from nearby colleges or universities. They may not be motivated enough themselves to work on the problem. We will have to take one or two interested scientists there to have a discussion with them, to boost their morale and to convince them that they can do it. Looking at things from a scientific angle is very helpful.

Secondly, there are some legal provisions, some of which work and some do not. For example, the Criminal Procedure Code 133 is a powerful clause about situations where public health is affected or nuisance is created. From all the accounts, this is something that could be tried. If we cannot get the District Magistrate to take action, we could try a Writ of Mandamus. In addition we could try to put political pressure and organise newspaper campaigns. These may not lead to a logical conclusion. But we are able to create an environment in which these people are cornered and more attention is focussed on the problem. Nani could also try to work with young lawyers from his area. For example, in our own case, our High Court petition was quite comprehensive because we worked in the first round with the Lawyers' Collective from Bombay. Even for filing a case in the Supreme Court we need well prepared documents. How will people become capable of doing this in the long run? We need a decentralised mechanism. As Prasad pointed out, we should utilise the opportunity of filing a public interest litigation.

In the long run, as Tom Kocherry said, we need to work on the terms of justice for living decent lives. We found that in the Karnataka High Court, we did not know how they would respond. In the very first hearing, they immediately transferred it from a single judge bench to a divisional bench.

**Chowdhri:** When there are dams, the government says it will pay compensation. We put our case to the Supreme Court more than three years ago but nothing is happening. Sometimes it is said that the file is lost. This is the state of public interest litigation.

**Nani:** One of the major constraints we have with the pollution struggle is that the problem is highly technical and voluntary help from the technical institutions or research institutions is totally absent. I will give you an instance. The Central Leather Research Institute (CLRI) is supposed to have developed technologies for treatment of pollution. An official working in the institute—he never wanted his name quoted or brought into the picture—said that they have purposely designed a treatment plant, which cannot work anywhere. He said, "We have designed a plant and it did not work and we have no problem now. Until we develop another plant, we will be completely out of the picture." This is something disgraceful. But it is there and it did happen in one of the tanneries. They did instal a plant which was jointly developed by CLRI and NEERI, which was a total fiasco. Taking a lesson from that, the tanners say they got a treatment plant but it failed miserably. How can we except them to invest money on it?

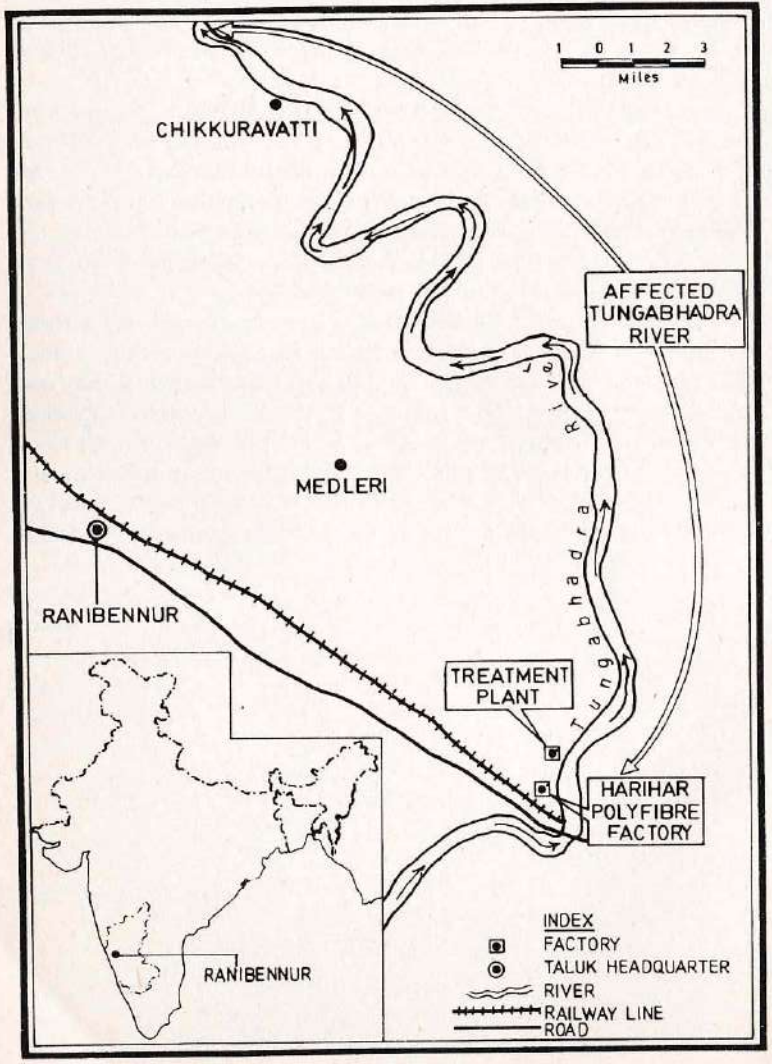
**Stoel:** India has got quite a sophisticated scientific and engineering establishment and some very progressive officials. You could talk to them about new investment in this country. It would save a lot of problems in the future if you can solve the problem in new plants. Indian scientists and engineers will figure out rather quickly that the cost is quite cheap. If they say it is too expensive, you could make your own judgement and perhaps use Bhopal as an example of the kind of thing we cannot allow to happen.

NRDC would be happy to help if we could find a US connection in your pollution problem, that is, a US company, investment or technology. Particularly after Bhopal, one can put a lot of pressure on US companies or investors that might be causing pollution in India.

**Agarwal:** As far as new investment is concerned, I guess there is a lot more care than in investment made in the past. But there is a major problem—the existing scientific establishment is not available to the social worker. Western NGOs have much more access to technical information as compared to us. Even in the West NGOs do not control the scientific establishment, but they do have greater access than we have.

The second point, however, is that even though the Indian government is developing systems for pollution control, standards, machinery and so on, NGOs find that these things are rarely implemented. They have to force the implementation of what the government itself talks about, but does not do. The Water Pollution Act was passed in 1974 but if we look at the track record, it is abysmal. Every chief minister and every minister wants to disregard the act and let industrialisation proceed without any controls.

RANIBENNUR TALUK
TUNGABHADRA RIVER SHOWING
LOCATION OF HARIHAR POLY-
FIBRES AND TREATMENT PLANT



# How to fight a corporate giant

S.R. HIREMATH

We were first exposed to the impact of pollution early in 1980 when we began working with the rural poor in a cluster of 21 villages in Ranibennur taluka in the drought-prone Dharwad district of Karnataka, through a voluntary agency called India Development Service (IDS). This voluntary agency has been working with the rural poor, women, fisherfolk, washerfolk and others, organising them on health and other issues (mainly preventive and promotional). There is also a dairy project for women and a shepherding project for spinners, shepherds and weavers.

More important, the IDS has acquired the skills of organising the rural poor around an issue. The Samaj Parivartana Samudaya (SPS) focusses on supporting campaigns through a scientific study of pollution using a multidisciplinary team of scientists, conducting environment education camps, training for non-violent direct action, publication of books and reports, facilitating filing of public interest ligitation along with the affected people, and helping IDS in planning for the better use of barren lands and *gomal* lands (common grazing lands).

The role of the people in all this activity is central. Villagers have formed environmental committees whose functions are:

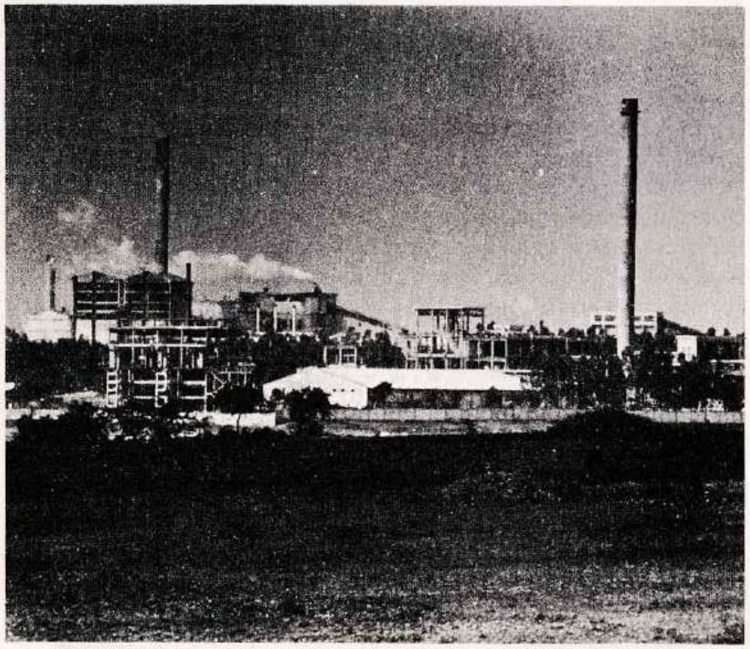
1) to make the villagers aware of the environmental problems, their causes and what people can do;
2) to help scientists in collection of data for their work;
3) to learn the techniques of non-violent direct action through training; and,
4) to be in contact with other villages which are also affected

and together with them, organise camps and training programmes.

The community organisers of IDS and the concerned villagers are doing their best to facilitate the involvement of women and the poor as equals in these committees.

The people of these villages strongly felt that many aspects of the various constructive programmes that they had undertaken, were being negated to a great extent by the water, air and soil pollution caused by two industries at Kumarapatnam (Ranibennur taluka): Harihar Polyfibres and the Grasilene units of the Gwalior Rayon Silk Manufacturing (Weaving) Company Ltd. (GRASIM), owned by the industrial house of the Birlas.

The two units use chemicals like caustic soda, sulphuric acid, carbon disulphide, sodium sulphate and over 600 tonnes of wood every day. The Harihar Polyfibres Company, commissioned in 1972, produces about 165 tonnes per day (tpd) of rayon grade pulp, generating about 33,000 cu. m of industrial effluents per day. The Grasilene unit, commissioned in 1977, produces 800 tonnes per month of Grasilene fibre using rayon grade pulp of Harihar Polyfibres and releases about 11,000 cu. m of effluents every day. Together, the two units release about 440 million litres of effluents into the Tungabhadra river every day. As many as 11 out of 21 villages, where IDS is working, are on the banks of the Tungabhadra river or within one km of it.



**The Harihar Polyfibres factory.** M. USSMAN

Well over 100 villages have been affected by air or water pollution, or both. The impact has been hardest on the poor; the fisherfolk and washerfolk, who are among the poorest of the poor, have contracted skin and abdominal diseases, as they have to drink this polluted river water whenever borewells fail, as they often do.

A study by the fisheries department shows that both species and quantity of fish have been significantly reduced due to frequent fish kills. Some fisherfolk have been forced to become landless labourers. In this predominantly sheep-rearing area, the sheep drink river water and are found to have a larger percentage of abortions or stillbirths than those which drink inland water.

Women are probably affected most by the pollution, since it is they who bring drinking water, wash clothes, look after the health of the family, take care of cattle and also work as labourers in the fields irrigated by the polluted river water. Hardly any women work in factories. Women in Nalvagal which is perhaps the worst affected village, also lost their traditional fields, as over 800 acres of land was acquired by the government and handed over to the factory at a 'reasonable rate'.

In the early years, the villagers still believed that only the politicians—especially the elected representatives—could help them in stemming this pollution. After a bitter experience with the elected representative of the area in 1981, the villagers started wondering whether there was any way out of this complex situation. It was at this stage that an organisation called the Transnational Centre for Non-violent Social Change (now called Samaja Parivartana Samudaya) was formed.

Many villagers felt that the Birlas were too powerful and could influence the government, especially as they controlled some politicians. We felt that we should have a dialogue with the people and see whether they were really interested in constructive action. A few of us from voluntary organisations and a few villagers started a padayatra (foot march) from village to village. We found that people were indeed interested; since we were 'deschooling' ourselves from our earlier background—learning rural development and so on—we did not quite know how to go about it. We decided to learn from other people's experiences.

Scientist Madhav Gadgil from the Indian Institute of Science put us in touch with the Kerala Sastra Sahitya Parishad (KSSP). Vijaya Madhavan in Calicut had studied Grasim's pollution in Mavoor, on the banks of the Chaliyar river and was working with the affected people there. Four of us went to Calicut and we studied the situation. The first important lesson from our experience was that if there has to be sustained struggle, it has to be waged by the affected people themselves. These people can understand what pollution means inspite of all the scientific jargon. We were, in fact, surprised that several pollution indicators were being very freely used by the people—they were relating it to their daily lives.

This reinforced our approach to rural development, but we also felt that it was equally important to supplement this with a study by concerned scientists. However, we felt these scientists should be from nearby areas to keep in more continuous touch with the situation, and also to enable them to learn from the people themselves. The experience of the KSSP was that there were several phenomena that scientists would not be able to understand on their own. For example, people were able to observe that fish were dying, but the presence of mercury was only detected later by a study, which was done, I believe, by the University of Calicut.

Just as we had found rural development an extremely rewarding experience—a process through which we grew, along with the people—we thought that this environmental problem was also a great opportunity not just for those of us who were staying in the village and working with the people, but also scientists who were concerned about the effects of pollution.

We decided to organise first through schoolchildren and then the more affected communities. Fortunately, we had a wonderful person from Gandhi Vidyapeeth in Gujarat, Jyotibhai Desai. He had organised camps teaching trainees in some of he most live situations, during the Bangladesh crisis of 1971, rehabilitation of dacoits from the Chambal Valley, Naxalites in Bihar and the dam disaster in Rajkot, for instance. We felt that the environmental problem must become a vehicle for organising the poor, articulating their problems, and helping them learn from this process to oppose some of the local industries in their own area. We could predict some of the attitudes of the management. The teacher trainees from Gujarat and the villagers, nearly 70 of us, went to the big factory and asked for a visit. We were met by the chief executive, accompanied by the entire senior management. They all assured us how conscious of environmental concern they were and how they were doing everything possible to safeguard the environment. They told us they had built the best effluent control plant in the whole of Asia. "You are really wasting your time," they said. But when we asked them to give us their scientific data, and their signature at the bottom of a statement, sure enough, they would not give us anything!

### Activities during last three years

What basically began as an anti-pollution campaign in Dharwad has now become part of a broader environmental movement in Karnataka. The impetus for this process was provided by the larger collective learning process, leading to the vital connection between the growing poverty, marginalisation of people and environmental degradation. Organisations like the Federation of Voluntary Organisations for Rural Development in Karnataka (FEVORD-K), the Mannu Rakshana Koota (MRK), and Citizens for Democracy Karnataka (CFD-K), have been very important in this work. Also, close contact with the Centre for Science and Environment (CSE) and KSSP have contributed significantly to this process of learning.

During the last three years, starting with the anti-pollution events, we have moved on to broader issues like the exploration of alternate development strategies and linking local groups for joint action programmes under the broader umbrella of the Mannu Rakshana Koota and the Citizens for Democracy, Karnataka.

The campaign against the pollution of the Tungabhadra river underwent the following stages:-

1) A four-day *padayatra* through the affected villages to educate ourselves about the nature and extent of the pollution by listening to the villagers and finding out what was done earlier (1983).
2) Study visits to similar affected areas in Kerala and Madhya Pradesh (1983).
3) A 15-day orientation training programme in Gandhi Vidyapith, Vedchi, Gujarat, with teachers and villagers (1983).

4) A 12-day environment camp in four rural centres on the banks of Tungabhadra river in Karnataka with children, teachers and villagers (1984).

5) A five-day environment workshop with the villagers on non-violent direct action (1984).

6) A two-day training programme for organisers from amongst fisherfolk and for collection of data on recent fish kills (1984).

7) A vigil line in front of the Harihar Polyfibers and Grasilene plants on the event of World Environment Day (June 3, 1984).

8) A five-day workshop on Rural Development and Environment in Mugad Village (1984).

9) A five-day training programme for preparation for *satyagraha* on Gandhi Jayanti day (1984).

10) Satyagraha (Vigil Line) and symbolic burning of rayon clothes in front of Harihar Polyfibers and Grasilene plants (Oct. 2, 1984).

This non-formal approach is in a live situation; one learns a great deal within a relatively short span of time as the strategy has to be practical and its effectiveness is constantly put to test. We had emphasised that if anything happened there would be no running to the government—the village environment committee would see that it monitored the situation.

To the great surprise of the factory management, this happened exactly one month after our camp in January 1984. A massive fish kill took place in February, 1984 in the Tungabhadra river downstream of Harihar. Villagers reported that such fish kills had been occurring regularly two or three times a year for the past ten years because of the pollution by the two Birla firms. The latest was due to a large scale discharge of untreated effluents by Harihar Polyfibres, possibly to free the storage facilities for the next five days, because the government had asked them not to release effluents during the Mailara Jatra festival. For a stretch of 60 km, we could literally see tonnes and tonnes of dead fish.

This fish kill was an economic disaster for the fisherfolk. Nevertheless, there was a beneficial aspect—it awakened people to action. With the environment camp fresh in mind, the villagers reacted quite differently from previous times. They brought samples of dead fish to the IDS and TNC, who sent them to the department of fisheries and then to the Karnataka State Pollution Control Board (KSPCB) and Central Inland Fisheries Research Institute station in Bangalore. In addition, the villagers wrote to the Chief Minister and the government officials. Although the Pollution Control Board was reluctant to act initially, pressure from friendly government officials worked.

The result was that the board passed a prohibitory order on Harihar Polyfibres to stop the discharge of effluents and deputed a special team for investigation. Water samples taken two days later showed the dissolved oxygen (DO) levels ranging from 0.8 to 2.8 at various points along the river. Dissolved oxygen is a necessity for any kind of life, particularly for fish.

The prohibitory order was an unique event not only in the history of Birla factories, but the whole of India. It was treated by the villagers as a first and important success in their struggle When DO levels reached between 7.4 and 7.8, six days later, the ban was lifted.

The fighting spirit, fortunately, did not fade away. The fisherfolk felt strongly that they should claim payment for their losses. They wrote a letter to the Deputy Commissioner, with their signature and thumb prints, inviting him to take measures on their behalf.

### Vigil Line

The Vigil Line organised in June 1984 was a remarkable event. There were over 250 villagers from over 10 villages and some citizens of Ranibennur on both banks of the Tungabhadra. It emboldened the villagers, and now even the police and the security men looked at the villagers with respect and appreciation for their satyagraha for justice. The media covered the event very well and contributed to the mobilising of public opinion in favour of the struggle. A unique feature was the participation of women from villages, though not in equal numbers.

A satyagraha in October also received very good support from the citizens of Ranibennur, Hubli, Dharwad and Bangalore. The MLA of the taluka, President of the Ranibennur Municipality and the President of the Dharwad district unit of Farmers and Farm Labourers Association and their colleagues participated as equals with the villagers.

This time there were many more women of all classes, both urban and rural. Another unique feature was the burning of rayon clothes by two villagers, symbolic of non-cooperation with the two polluting Birla industries and the resulting adverse effect on the health of people, cattle and crops.

This also attracted the attention and concern of the press. They were shocked to see the flow of untreated effluents in sizeable quantities in the illegal channel, perhaps as much as, if not more than, the flow of treated effluents. What was more surprising was this blatant flouting of laws by the industries in broad daylight showing that they had nothing to fear from the government.

The next day, the press questioned the former industry minister about this matter in Hubli. He had no answers. This also led to a strong editorial in *Kannada Prabha*, a major Kannada daily.

The Pollution Control Board chairman and his colleagues decided to conduct a technical inspection of the two factories and invited the representatives of voluntary agencies to join them, as an attempt to coopt them. In the meantime, there was a news report about a five years study by the Karnataka Engineering Research Station at K.R. Sagar, Mysore, concluding that all major rivers in Karnataka were highly polluted. The report indicated that in several stretches of the rivers there was heavy industrial pollution. The Board tried to counter the findings of this study but SPS presented the facts it had and disputed the board's claims.

**Industrial discharge into the Tungabhadra.** M. USSMAN

Activities continued during 1985 and 1986. A proposal for the study of pollution caused by the industries and its effect on the Tungabhadra at Kumarapatnam was submitted to the Government of Karnataka by the study team of TNC. This study was approved and given to the Karnataka State Pollution Control Board (KSPCB), Bangalore. The study has just been completed and a report is being sumbitted. Also, three inter-village committees called Tungabhadra Parisara Samitis were formed, each covering over 10 villages on both sides of the Tungabhadra. Social forestry and wasteland development were promoted with the help of the IDS. Four lakh seedlings during 1985 and six lakh seedlings during 1986 have been raised by the poorest of the poor, including fisherfolk, Harijans and women; an 80 acre fodder project has been developed on common land with villagers of Airiani.

An environment camp focussing on forests and people was held in a village on the right bank of the Tungabhadra towards the end of 1985, involving villagers, tribals and voluntary agencies. On the anniversary of the massive fish kill, the fisherfolk continued their satyagraha in front of the factory in 1985, while Dr K. Shivaram Karanth, the noted Kannada writer, addressed them in front of the KSPCB regional office in Davangere in 1986. A major public interest litigation against the factory was filed by the SPS alongwith affected people in the High Court of Karnataka in December 1986 which made major headlines on the front page in most newspapers. Some 15 affected fisherfolk, with the help of government legal aid, have filed suits for compensation in the Ranibennur magistrate's court.

Even though the problem is not yet fully solved, people are noticing appreciable changes in the quality of the Tungabhadra. It seems that enough pressure has been exerted on the factory and the Board officials to do their job better.

### Joint Sector Company

A joint sector company called Karnataka Pulpwood Ltd (KPL) using Rs. 30 crores of public money and 75,000 acres of common (C and D class) lands in Malnad, was formed as a result of an agreement between the Karnataka Government and Harihar Polyfibres on November 1986. Dr Shivaram Karanth called on the people of Karnataka to protest against this growing friendship between the government and the Birlas, which would lead to further environmental degradation and deprive the rural people of access to their common lands for fodder and fuel.

The voluntary agency Arogya Vikas Prakalpa in Shimoga took the lead in publicising the issue in the five talukas where 75,000 acres of land were to be given over to KPL. Local environment committees have been formed to protest through the local authorities to the government. A study to access the C and D lands in the five talukas has been launched.

The Mannu Rakshana Koota (MRK), a broad forum of rural poor, has been formed at the State level in various parts of Karnataka, consisting also of Gandhians, farmers, journalists and environmentalists. Its job is to support grassroots action groups, disseminate information about their efforts to the press and also make representations to the government and the legislators.

The MRK sent a comprehensive memorandum on the KPL and the farm forestry scheme to the Chief Minister. Both are meant to benefit Harihar Polyfibres. A delegation consisting of Mr Chandrasekhar, former Chief Justice of Karnataka High Court and key MRK members met with the Chief Minister, Ramakrishna Hedge in August 1985.

As a result of these efforts, it is reliably (though not officially) learnt that the farm forestry scheme has been dropped. However, the government did not cancel the agreement forming KPL, but once people have been organised, they will continue their struggle. Some of them, with the help of MRK, have filed a case against the government in the Karnataka High Court.

It now seems that the KPL has moved out of at least one taluka— Sagar—and is moving to other districts like Dharwad and Belgaum. MRK has organised protests in these new districts. In fact, a week long protest took place in six districts in November 1986, the second anniversary of the agreement between the government and Harihar Polyfibres.

## Related Issues

As we got involved moie deeply in environment issues, we understood the linkages between various other issues. For instance, social forestry is a major issue for many voluntary agencies

in Karnataka. Our study of the Rs. 55 crores Karnataka project, funded by the World Bank and Overseas Development Administration (ODA) of UK, shows both conceptual and implementation problems. We prepared a memorandum on behalf of FEVORD-K and sent it to the state government, World Bank and ODA and are trying to work with them to make it— to the extent possible— relevant to basic needs of people like fodder and fuel.

The Kaiga atomic plant is another issue. We are trying to be of whatever help we can to the local people who want to know the hazards of nuclear energy, about which neither the atomic energy establishment nor Karnataka government are providing details.

## Conclusions

Our experience both in the case of the pollution of the Tungabhadra and Karnataka Pulpwood Ltd. shows that it is possible to involve villagers, especially the poor, in environmental education and action, provided these programmes start from their own needs, build on their knowledge and aim at helping them to solve their own problems. However, it is very important to understand the relationship between the marginalisation of people, social injustice, poverty and environmental degradation and to keep this relationship in focus at all times.

Our efforts also make it clear that if done systematically, data gathering, education and action can lead to tangible results. The considerable awareness created amongst fisherfolk along the Tungabhadra and farmers in Shimoga about their problems, and the ability to deal with government officials and others shows tremendous potential.

Putting pressure on the government can lead to some relief in their suffering. The Tungabhadra is less polluted today by the factories at Kumarapatnam; the Karnataka Pulpwood Ltd. has moved out of Sagar taluka; and, the farm forestry scheme to benefit Harihar Polyfibres has been scrapped. The same people's organisations can be very effective in making social forestry, at least in their area, really social as some villages in Ranibennur, Sagar, Shimoga and Kolar have done.

This has also encouraged some local government officials to take up people's problems sincerely. This is true of local officials of the regional office of the KSPCB, who are showing films and helping to collect water samples more quickly than in the past.

This partnership is helping to better document fish kills in the Tungabhadra.

These people's organisations are also learning to create awareness among many more people, as happened during the Mailar Jatra this year where the Tungabhadra Parisar Samiti held an excellent exhibition on pollution and its effects and collected over 6,000 signatures for a petition to the government from other affected persons and sympathisers.

Voluntary agencies like SPS have also found that it is possible to involve concerned scientists and be funded by the government. It has helped bring concerned government officials closer to the affected people. Some of the national and local scientific bodies like the Central Inland Fisheries Research Institute (CIFRI) in Barrackpore, National Institute for Occupational Health (NIOH) in Ahmedabad and Institute for Animal Health and Veterinary Care in Bangalore have responded positively to requests for preliminary exploratory visits and later conducted detailed studies. Other scientific groups like the Karnataka Rajya Vignan Parishad (KRVP) and ASTRA (Cell for Application of Science and Technology to Rural Areas, attached to the Indian Institute of Science in Bangalore) are also gradually responding to working with the people.

Most of all, our experience tells us that affected people understand how their various problems are linked to a wrong development policy. This was evident when persons with different problems in six districts came together to protest against the joint sector Karnataka Pulpwood Ltd.

**Pande:** If some initiative has been taken on industrial pollution, it is usually when the community has been able to organise itself and force the authorities to do something. Recently, a minor gas leak took place in Kanpur in a chemical factory. More such incidents are being reported after Bhopal. Some ten or 15 people were admitted to the hospital. The problem was serious and the factory was closed. Since then, 700 people are out of jobs. The owners of the factory can survive even after closure but the workers cannot. In such cases, something has to be thought about the workers. If we put jobs against safety, a gap will be created between the work force and the factory and the communities.

**Agarwal:** Why do you not give us suggestions on how this can be avoided?

**Pande:** I do not think this can be stopped under the present circumstances. We have to consider what these industrial products are, how much we need them and how the entire production process can be reorganised in a more meaningful manner. All these questions cannot really be thought of by workers themselves unless the community and workers are involved in decision-making. Right now, the problem is very difficult. I am not talking only about pollution; I am also talking about health. For the last four to five years, we have been trying to raise the question of health and safety in the workplace but we are not succeeding, primarily because in the Indian working class movement, there has not been any tradition of raising demands of this kind. There has not been any educational effort; there is complete carelessness on the part of the government and the management.

As far as the workers themselves are concerned, they often do not feel that they are in a work situation because, howsoever bad may be the workplace, it is better than their homes. At least they have a toilet and in some places, a fan over their heads and some electricity. If I think about textile mills in Kanpur, the first shift starts at six in the morning—70 to 80 per cent of the workers use the factory toilet and then go to work because they do not have any arrangements in their home. So, however intensely we talk about working conditions, they never get priority. The general feeling is of resignation. The workers feel that they cannot do anything about it and we have such a large number of unemployed people that in every struggle, almost every picket line is being broken these days by a large number of unemployed people who are willing to join the work force, however little the employer is willing to pay. Even if we worsen work conditions, we will find people willing to work for a lower wage.

These are migrants to Kanpur from eastern UP, from the hills of Bihar, from MP and Rajasthan. Whole families are migrating but where do they live? In my childhood, there were some huts in Kanpur; now almost everywhere you find hutments—on both the sides of the railway tracks, even graveyards have been occupied. There is no drinking water or electricity.

The phenomenon of urban slums has to be understood. We have to forget this myth that big towns still offer very much. They may offer comparatively more than smaller towns but the workers just do not have anything to subsist in rural areas. At one level, this is creating a cleavage between urban and rural people. I think the problems are like peeling an onion—they start coming up one after another, and they are building up. In my experience, most cases are local manifestations of national and international problems.

**Kocherry:** We are trying alternative experiments in this context. Traditionally, marine pollution is the result of oil that is coming out from boat engines. On the one hand, pollution is also caused in the name of removing physical hardships in manual operations. The fisherfolk do not want to proceed forever with physical methods and they are happy with their outboard engines. But, again, how many outboard engines can we have? There is a shortage of fuel which the whole world is going to face. Even the Japanese are experimenting with large ships operated by wind; they are going back to the wind even for larger ships. Traditional fisherfolk knew how to use the wind but are now turning to outboard engines.

We are trying to combine these two things—when we want to cut through the breakers, we say use engines by all means, and we can continuously operate for 365 days in a year. But use the wind to the maximum and stop the engines then. So wind sail can be combined with engines. This is an example of tackling pollution and also the shortage of fuel and preserving traditional skills.

**Prasad:** It is true that the workers in any chemical industry or any other industry are prepared to do work under any hazardous circumstances provided some money is given as compensation.

Working conditions are miserable in many factories in Kerala—Hindustan Insecticides, Fertilizers and Chemicals, Travancore Chemicals and Cochin Refineries. The factory can provide safety measures but it will just not do it and it will save money. I would blame the trade union leaders. We have had the workers' education programmes since industrialisation came to the state. In our campaigns, we have tried to penetrate into the factory and tell the workers some basics about pollution and what best they could do. But they are always shutting their ears. They say, "If we hear you, it will prompt us to demand closure of this factory; we will lose our jobs." Whenever there is any cry against pollution in a factory, even the most extremist union joins hands with the management.

There is another category of people who give them wrong advice—so called labour lawyers or labour leaders. I will provide

an instance. The Wire Ramps factory in Mavoor near Calicut once closed down and there was a lay-off; the factory did not pay the labourers. They did not register a case of an industrial dispute. The workers cannot be laid off unless there is a natural catastrophe or power failure. If they close down for any other reason, the labourers will have to be paid. If a factory is closed down because the pollution control board asks them to do so, the workers have the right to full wages. They did not press for this but they marched from the factory to Trivandrum, the state capital, and it was made a political issue. Finally, the company paid up. I got this information from no less than a deputy labour commissioner who asked me to advise the labourers to register an industrial dispute.

The workers were not aware that they had the right to work in a safe area. We have the National Safety Council. To my knowledge, it is governed by the managers of industries and some politicians. So the managers will always see that factory employees are never exposed to this information.

I know of a worker who was working inside a chimney in Gwalior Rayons at Mavoor. Somebody advised the company to get rid of its sulphur dioxide, so it was spraying ammonia down the chimney and ammonium sulphate was precipitated. Unfortunately, the chimney got blocked. A worker was prepared to get into the chimney and break open this block, exposing himself to ammonium sulphate. We interviewed him and he said, "Sir, what are you saying? I am getting Rs. 150 per day. That ammonium sulphate is not going to do me any harm because I have worked there for the past one week." We went to Hindustan Insecticides, where the labourers were filling gunny bags with DDT. They were not wearing aprons, masks or gloves although they were provided with these. They were all locked up in the lockers. Again a worker argued with me, "I have been doing this job for the last 30 years, I have not been affected by this DDT." They are ignorant about the dangers and unions also have to bear the blame for not trying to educate the labourers on these lines.

After Bhopal, every state was asked to prepare a list of polluting industries. To my knowledge only Gujarat did. Our own state notified that it is going to form a committee and ask the State Committee on Science and Technology and Environment to name three persons to this committee. I was one of them but the committee was never constituted. We can understand why the government is reluctant to bring out a status report on various industries in the state.

The private sector works for profit but what about state-owned companies which are saving money at the cost of pollution abatement? Fertilizers and Chemicals Travancore, have installed a sulphur dioxide and water treatment plant, but they are not working. We have tried to talk to the workers. They say that the management stresses that if we enforce pollution control, we will lose our jobs. Why do we not make a concerted endeavour to expose the working class to this kind of knowledge and prepare them to demand a clean atmosphere at work, so that they can live longer and work longer?

**Ui Jun:** A few observations may be useful. The most commonly used strategy in Japan in the past was to separate the workers and victims and let them fight each other. Such plans were very frequently prepared by company managements. If we could take stock of the situation and tried to overcome this difficulty, common fronts between workers and victims could occur frequently.

**Kocherry:** One of the most frequent criticisms levelled against environmentalists is that we are against all development. Maybe we do not have enough research and other alternatives to propose when we start but we are convinced of the need to fight. In the process, we go into multi-dimensional aspects.

I thought Pande was too pessimistic. Today, trade unions are very much oriented towards their membership—whether in the organised or the unorganised sector. Maybe a turning point will come when the movement looks towards the community and looks at all the aspects of the problem. Then we will look at trade unions in an altogether different way, not only for membership and bargaining. Other groups will also play a supportive role. Today unions are playing no role at all, because they are not oriented towards the community.

**Pande:** Most of the people who are not directly associated with the trade union movement are carried away by the myths that are being raised about working class people by vested interests in this country. There are certain things which are very wrong in the established trade union movement and I am not here to defend that. We have as much self-criticism as any other groups or organisations have. We have to look at the trade union movement also in Europe and in Britain particularly. It has been a product of a particular historical process of industrial revolution. When industries were growing, they were making huge profits, and they had big colonies at their disposal to exploit the raw material and captive markets to supply the finished goods at their rates, they were in a position to give some concessions to the working class and to buy peace with the workers.

Great trade union movements developed in this country, and in many other parts of the world. When industry declines, there is a crisis in the trade union movement itself. We are passing through that kind of phase, particularly those trade unions which are involved in collective bargaining. I do not devalue the importance of wage struggles and I do not call workers high wage-earners even in the organised sector.

Collective bargaining does not exist in most places today. There is no question of seeking more concessions, but protecting the rights that were earlier achieved after much sacrifice. We are trying to tell our workers that it is not the question of wages alone. What is the advantage of getting a Rs. 20 increase if the entire atmosphere is getting polluted, if we are not able to get pure drinking water? These questions are being taken up; it is not that the working class is every insulated.

Unions engage in collective bargaining and they must turn to social movements also. In the last ten or 12 years, there have been some significant movements in this country concerning peace, women, the earth, environment, appropriate technology. Many individual groups and organisations are doing remarkably good work. The need is to identify the areas in common where we can work together. I think the objective conditions are forcing working class movements to change their positions and other organisations can help in this process and accelerate it.

**A.B. Mishra:** We have not been able to succeed in getting companies like Orient Paper in Sambalpur to go in for a treatment plant. Only three or four years ago, the pollution control board nearly certified that the Birlas are polluting the river. The mercury levels are dangerous and there is a lot of difficulty in arranging funds from the Department of Environment. Levels of mercury from mercury discharge into this river—and the Hirakud Dam forms the biggest reservoir in the north—on whose waters a lot of people depend, is risky.

I will mention a few of my efforts. When I went to the Rourkela Steel Plant, I talked to leaders, students and active citizen groups. I got one answer: "How do you expect us to fight against a concern which gives us our bread?" Students said, "We can do that, but for how long and where does it end? Can you help us in our moments of distress? Why do you involve us against a company where we work?" The same thing happened in Arganpur, where I tried to talk to students at Dalmia College. They said, "Dalmia pays us our salaries." There is a huge tribal area around and tribal students stressed how they were getting handsome scholarships from Dalmia. "If we start fighting against him, our scholarships will go; please excuse us. We cannot fight against Dalmia." I began to wonder why should I waste my time in an area where I will not be very successful. What can we do about it and what are the alternatives? These are the attitudes of workers, ordinary citizens, so-called activists in urban areas and student leaders. I am not finding a way to overcome this.

**Laba:** One comes to the conclusion that in most cases of pollution and environment in general, the clash with the state is a political matter. I do not think the state is going to wither away for quite some time. So why do we not open two new chapters? One I would like to call the "politics of pollution" and the other the "economics of pollution". In the politics of pollution, I would like people to ask why the controversies do not come up. There are cases of purely environmental problems being used to solve political questions.

The economics of pollution is quite clear. When the power supply goes down, the first thing you do is to shut the pollution treatment plant and continue production. I drew this lesson from my earlier experiences as a civil liberties worker. I realised that it is in the interest of a lot of people to keep an area declared as disturbed. Once an area is declared disturbed, all the local and central government servants get an additional 50 per cent allowance of their basic pay. So if you have an area disturbed for 13 years, that is a very strong incentive.

**Ui:** Politics of pollution is my title and there is a lot of politics in it. In Japan we use thin copper coins. We can get new copper coins in any bank. We distribute them in every city and expose them to the air for one or two weeks on a window sill, and collect them and put them on the map of the town because this is the map of air pollution. This was published in the newspapers and then the polluting industries had to do something. If it is disclosed in that way by the local citizens, it is very effective. Studying pollution is the first step to reduce it. Also if we have relevant contacts in the local economy, even the strongest industry cannot impose its will. The final answer to pollution control is strong local self-government.

**Nani:** We have been having strange experiences with workers. When we started talking about this pollution problem, there were mixed feelings. They were even afraid to talk to us. The only explanation they could give is that it would deprive them of their jobs. What could we do then? We are not against industry but against pollution. We want social justice to be done. After the seminar we held we contacted the Ministry of Labour to launch an education programme for the workers. Generally such programmes are arranged by the Ministry of Labour with the cooperation of the owners. We said why not try to do them ourselves? Why should the Ministry of Labour contact the owners? Finally, they said okay. We received very little assistance from them. Recently, we had about 50 workers coming voluntarily from about 50 industries and had a very interesting session with them.

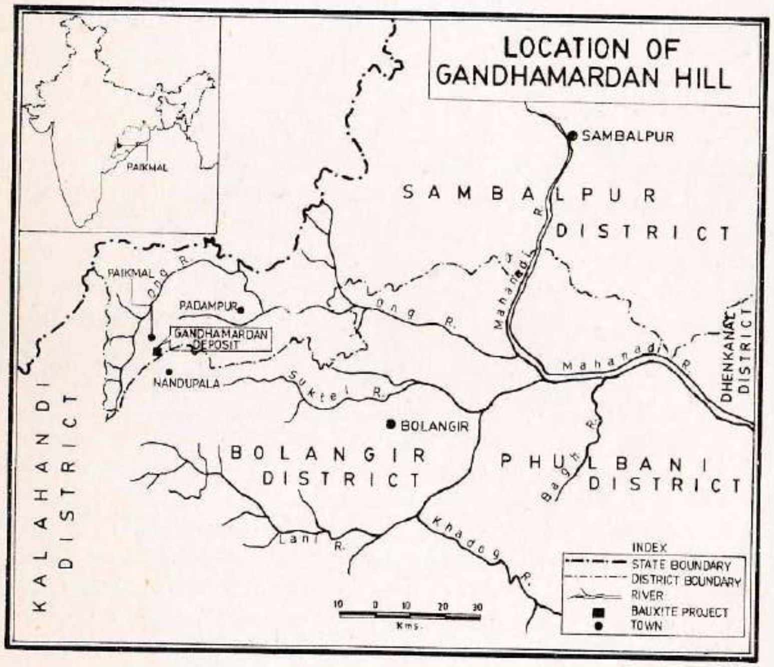
It is not that they are unaware of the pollution problem, but they are wondering what is the alternative. If this industry is going to stop or close down, how are they going to survive? After five days of training, they literally came out saying that even if these industries close down, we will have our own industry. We will go ahead with the work. So that was very unique.

When an industry grows very fast without taking into consideration pollution control, we get into trouble. But the workers understood the concept of pollution control. We made it very clear how this pollution occurs, how we can control it, what are the health hazards, how the owners are spreading diseases into the villages, etc. These 50 workers resolved to take this message to all their friends in the factories. I am very happy to say that in almost 35 factories, there is already a loose structure of unions coming up. This is something positive; so far there was no union or anything of the sort. After training, there are signs of people getting organised. They talk of pollution control and various other facilities which are meant for the workers. This is quite something.

**Hiremath:** What alternatives do people have? It is important to work on that question. Our fisherfolk have been able to muster the strength to fight because they know that scientific evidence is in their favour. There are various alternatives open to people regarding social forestry schemes in Karnataka. These employment opportunities may not be as lucrative as in factories, but at least they have got them.

I was talking about "appropriate technology" for organisations. There are a lot of opportunities around. We have to look at them in the long run. In Karnataka, as we were beginning to work on the pollution case, we recognised that one of the organisational bases is the Federation for Volunteer Organisations for Rural Development (FEVORD). Even though they came together for their own training and liaison with government, ultimately all these people recognised that isolated efforts are not going to lead them anywhere. We have to look at the larger picture. Our social forestry campaign has made the forest department extremely uncomfortable. Now they are coming a little bit forward with decentralised nurseries. We are putting them on their guard about the subject of land. To give a few acres of land to a group of poor people involves much red tape and hassles, but they are giving thousands of acres to this company even from reserved forests. When we found out that this was going to happen in Shimoga and Chikmagalur, there was only one small voluntary group there. But because 75,000 acres of common lands were being taken away, it was a very good way to mobilise a larger number of small action groups.

When we held a week-long action programme against the Kaiga nuclear plant in Karnataka, we got a lot of attention. While groups were working on this in north Kerala, many of the voluntary organisations did not think about nuclear energy at all. They said, "How many things can we work on?" Slowly, they are recognising that a big chunk of the state's resources is going in this direction, whereas the government is so hesitant to allocate what is very badly needed for the basic needs of the people. To my great surprise voluntary agencies are now taking quite a lot of interest in nuclear energy and the experience we have gained in the pollution case is very helpful. Once we start working on specific issues like rural development, get the writers and lawyers involved, this brings about a momentum and prepares us in the long run to question the development strategy and make changes collectively. Even in a small way, since last three or four years, voluntary organisations have become united. When a letter went out from our organisation about a sum of Rs. 300 crore being given on a platter to coffee planters in one district because they had a lot of political pressure and we said that the trees would be theirs and they could cut and take them even though they never really owned the land, the government cancelled the whole proposal. I am not saying we always have success. We have had a lot of failures. But recognising our own limited resources and working in a very systematic way is creating a much better environment. The realisation is growing that we are not alone, we can work together and mobilise things and move people with our forces. So this organisational aspect of our work is as important as the technical aspect.



# Mining a hill and undermining a society: The case of Gandhamardan

A.B. MISHRA

The Gandhamardan reserve forest, with an area of around 300 sq km, situated on the borders of Sambalpur, Bolangir and Kalahandi districts of Orissa, is a rich ecosystem. The undulating hills have a maximum height of 3300 feet with a few other peaks between 2700 and 1800 feet, with an extensive plateau at the tip, covered with a hard laterite crust and a luxuriant growth (2 metres to 3 metres high) of grass. There are also sparsely distributed trees.

Know as *Gandhagiri* in mythology and believed to be the *Gandhamardana* of the Ramayana, this hill is proved by historians to be the famous *Parimalagiri* of Buddhist literature, the plateau on which there was the international centre of learning, *Parimalagiri Mahavihar* cited in Hiuen T'sang's reference as 'Polo-molo-kili'.

There are two ancient temples on the northern and southern foothills of the plateau, Nrusinghanath and Harishankar, in Sambalpur and Bolangir districts, respectively. They are situated near two perennial streams, the water of which is believed to be sacred. An attempt was made not long ago to steal the "burning eyes" of the temple's deity, which has the figure of a cat. Fortunately, the attempt to steal these firestones failed. People from Chhattisgarh area of Madhya Pradesh come to throw the bones of their dead elders into the Nrusinghanath stream, called the *Papaharan Tirtha* (water that washes away sins). The local people believe that this is their Ganga. There are more than a dozen fairs here every year, attended by thousands.

This area can be approached from the Khariar Road railway station on the Raipur-Waltair rail route, followed by a 50 km road journey. Raipur is the nearest airport, from where Paikmal is a two hour drive. Jharsuguda on the Bilaspur-Howrah rail route is another approach-point with a 240 km road journey up to Paikmal via Sambalpur-Bargarh-Padmapur road. Harishankar is approachable from Bolangir on the Jharsuguda-Vizianagram link railway, with a 40 km road journey. Bolangir is well connected to Sambalpur by road.

The richness of the Gandhamardan ecosystem is remarkable; its water resources, with over 800 small perennial springs and many more rainfed ones, supply water through 63 small streams to 17 large streams joining two rivers, the Ong and Suktel, tributaries of the Mahanadi (Maa-Nadi or Mother River of the state).

Three streams, on their way downhill, form four waterfalls, 30 feet to 40 feet high. A partial vegetation survey of the slopes conducted by the Botanical Survey of India, more than two decades ago, recorded a diversity of 2700 flowering plants, 125 medicinal plants and 220 species of medicinal, quasimedicinal and economically important plants. On the banks of the streams, ferns and lichens grow profusely.

Although animals have not yet been systematically surveyed, local and forest department sources claim that a rich variety of fauna exists, including mammals like the tiger, leopard, sloth bears, palm-civet, jungle cat, wild boar, mouse deer, sambar, barking deer, fox, hover, jackal, wild dogs, red and black faced monkeys, bats and porcupines. All over these hills is a semi-arid type of vegetation, mostly deciduous. There are also semi-evergreen growths. The late professor N.K. Sahu, a historian, has claimed that this semi-evergreen vegetation is not a natural phenomenon. This is not a forest, but a garden. The Buddhists were interested in two major areas of research — Ayurveda and Tantra — and because of their interest in Ayurveda, Buddhist scholars apparently tried to collect a variety of species from various parts of India and other Oriental countries. They tried to plant these exotic species here, because of the plentiful water. That is why there are certain rare trees and shrubs here which are not visible in any other part of Orissa.

The forest has no human habitation, due to the absence of habitable valleys, but is surrounded by the villages and towns of Jharbandh, Paikmal, Padmapur and Gaisilet blocks of Sambalpur in the northeast, Naupara block of Kalahandi in the west, and Khaprakhol and Patnagarh blocks of Bolangir district in the south. Most of the people in the villages of these blocks are farmers and agricultural labourers, depending indirectly and directly on the forest. More than 200 villages, with a population of around one lakh are directly dependent on the forest.

About 2 per cent of the people own more than 4 ha of land and about 3 per cent have 1.2 ha to 2 ha. About 40 per cent are small farmers with 0.8 ha to 2 ha and 25 per cent are marginal farmers with less than 0.8 ha. About 30 per cent are completely landless, depending on daily wages and forest produce for their living. Interestingly enough, the landless neither migrate to urban areas in large numbers nor work as bonded labourers. This is mainly because the forests supply them with subsistence needs and seasonal employment. This does not mean that the poor of this area are completely free from exploitation. Money lenders, government officials, liquor shop owners, kendu leaf and other forest product purchasing agents, play their same dastardly role here as in other rural and tribal areas of the nation.

Food is the most important link between people's subsistence and forests. About 30 to 40 varieties of edible roots and rhizomes are collected from the hill slopes. When old women were asked about the leaves and edible flowers they collected from the forests, they identified around 40 to 50 of them. Not only the poor, but the rich too eat forest-based foods. The best example of

**BALCO's land acquisition: illegal methods.** A. MISHRA these are the soft parts of the bamboo, called kardi and hendua. Mahua seed and sal-seed oil is a very common cooking medium. The alluvial soil of the area encourages good growth of citrus and other fruits, and vegetables, which the local cultivators rarely consume. They sell these, preferring to eat fruits, berries and mushrooms collected from the forests.

People grazing cattle in the forest rarely carry any food in certain seasons, when fruits are readily available. An example is *bhat-kendu*, the seeds of which look like boiled rice and taste good. In an hour, a person collects enough to fill himself and drinks a few handfuls of water at the stream. It provides enough energy for tending cattle and cutting wood. Most villagers eat meat and prefer birds to mammals, a variety of which are hunted. They are prudent predators in that they never kill pregnant and young animals and do not threaten the population of any species. Not much grazing land is found near the village; there is enough fodder on the slopes and fodder species can fill a long list. In the villages, dung cake or agricultural residues are never burnt. Wood is the choice fuel, but tree trunks are never burnt, except when landowners cut big trees on their own land. Slopes are never cleared for shifting cultivation. Poor people hardly purchase anything for housing. Wood, bamboo, a variety of fibres, minor timber like *karla* and thatch grass are always collected from the forest. It is only the landowners who go for bricks, earthen tiles and pucca houses. Very often, the poor prepare their own clay tiles in a semi-cylindrical shape called *khapra*.

Primary health centres exist in all blocks and some panchayats, but the people only go there when ailments are unmanageable in the village. Minor ailments are mostly treated by the village *vaidyas* or practitioners of indigenous medicine, as well as experienced housewives. Indigenous drugs are found for asthma, tuberculosis, sepsis, cholera, enteric fever, dysentery, skin ailments, snake bite, abortion and prevention of pregnancy. Plants which kill insects and fish are also known. On both sides of the hill, two colleges for Ayurveda have been established at Nrusinghanath and Bolangir, with a herbal garden at Harishankar and an immense potential for research and manufacture of drugs.

Going round the area during the summer and after the monsoons, we notice the ease with which people divert water from streams into their fields or use traditional lift systems. Prudent farmers of the area devote half of their fields for paddy and the rest for oilseeds, vegetables, pulses and local cereals. Marginal and small farmers collect advances from rice mill agents during the monsoon or premonsoon months to sell their paddy (although they have no surplus), paying paddy against high interest rates (more than 100 per cent). From Paikmal alone, around 50,000 bags of paddy is transported annually to Padmapur, Bargarh, Sambalpur and Jharsuguda. Paddy of this area — collected for Rs 50 to Rs 70 per bag from villages — is favoured by consumers because pesticides and fertilisers are hardly used. Fruits and vegetables are regularly lifted from the weekly markets by traders to nearby urban centres. Collection of minor forest produce is an important aspect of the economy of the landless and small and marginal farmers. Big landowners also sell these products from their trees.

Commercial exploitation of natural systems can easily alienate people from this nature, consequently depleting the renewable resources of the area. The commercial exploitation of Gandhamardan dates back to pre-independence years by local business communities and Birla's Orient Paper Mill with forest department approval. But no conspicuous deterioration was noted. The first major indication of danger to this ecosystem

Tribal labourers on newly made BALCO road. A. MISHRA

came in 1971 with a government gazette notification that about 2 million tonnes of easily exploitable quality bauxite-alumina was stored in the hill. Mica is also found there.

In mid-1976, the public sector Bharat Aluminium Company (BALCO) applied to the Orissa government for a mining lease over 3584 ha. In 1981 the Orissa government notified that 36 sq km of the Gandhamardan reserve forest was reserved for exploitation of bauxite in the public sector and a day later, a lease was hurriedly sanctioned to BALCO, much to the dismay of conservationists. Some activists went into the village to study the people's reaction and found that they had already been told that the mining activity would bring development to the area, provide employment and other services. Very few people in the villages foresaw the coming destruction.

In May 1983, the foundation stone for the mine was laid by the Chief Minister. A demonstration took place and his vehicle was stoned — possibly not by the demonstrators but other miscreants. Until mid-1985 there was an apparent lull. BALCO went on erecting the infrastructure while activists collected information and organised people. Villagers who had initially welcomed BALCO, now began to see the initial signs of destruction and started asking questions.

Some people filed a public interest case in the Orissa High Court. In the meantime the idol of Lord Nrusinghanath was stolen from the temple and people suspected BALCO's involvement. In June 1985, a group of National Service Scheme (NSS) volunteers camped at Nrusinghanath, went to the villages and lived with some families to understand their reactions more intimately. Some Sangharsha Bahini volunteers managed to stay in the villages after the camp and by August 1986, the Gandhamardan Surakshya Yuva Parishad (Youth Action Group for Gandhamardan Protection, GSYP) was formed with the active participation of local youth.

By then, the building of the road, railway, ropeway and water supply reservoir for the BALCO township had disturbed the people. GSYP discussed issues like deforestation, microclimate variation, silting of streams, dust pollution, the entry of frightened wild animals into villages because of blasting, in village meetings and workshops. The movement gathered momentum through rallies, slogans and signature campaigns, which resulted in direct action like relay hunger pickets on the BALCO road to prevent vehicles going to the mining sites, and boycotts by labourers from working for BALCO at the cost of arrests and litigation.

Time and again, the mining authorities said, "We will not do any harm to the ecosystem. The amount of forest that we will be cutting will be low. This is a completely mechanised mine." But the local people are not in the mood to allow BALCO to get away.

People from 40 villages have organised a kind of relay protest. From one village a day, some 40 people, including women and children come and block the road — they do not allow any vehicle to pass. What is more, they try to ensure that from all the villages around, nobody will work for BALCO.

When BALCO authorities tried to hire labour from Chattisgarh in Madhya Pradesh, the villagers spoke to them and told them: "This is your Ganga. Do you want to earn money by destroying the river where you place the bones of your forefathers? Decide." These people fled and are not cooperating with BALCO any more. The company is trying to go further into Andhra Pradesh and bring truckloads of labourers. These migrants are camping near the villages and the villagers are asking them to go, but not with much success, because they are being offered higher wages. During the road-blocking, the local police and administration have supported the company. They have arrested and filed cases in the local courts against many people. As many as 1300, of which more than half are women, have been harrassed in this manner. Women are more involved in the movement.

Initially, there was not much response from women. But when Sunderlal Bahuguna, the environmentalist, visited the area in February, 1986 and spent about five days there, he regularly addressed women. A rumour circulated that a saint from the Himalaya had come to see the devastations. He also met university staff and press reporters, which gave the movement strong encouragement. Gradually, journalists started visiting the area too. When peasants realised that the drying up of water sources would affect farming, they joined in large numbers.

In early 1986, a group of intellectuals from Orissa living in Delhi, organised the Gandhamardan Protection Committee and collected signatures to make an appeal to the Prime Minister. Some action groups like the People's Union for Democratic Rights and the Institute for the Study of Society and Culture visited the area and wrote their reports against the project.

Government scientists have generally been lukewarm to the people's protest. Earlier, when some scientists had visited the site and there was a news item to the effect that blasting would affect the temples, the State Pollution Control Board Chairman, Dr M.K. Rout, claimed that there was no danger. But the threat remains and the press has reported that some structures have collapsed due to vibrations. When the issue of rare medicinal plants and herbs was raised, Dr. Rout said: "What is the problem? We will lift the rare plants on the hill and grow them in the Bhubaneshwar Botanical Gardens." The agitators have opposed this. The Orissa government has asked the Department of Mines and School of Life Sciences at Sambalpur University to send a team of botanists to survey the hill and confirm whether the rare plants can be transported to these gardens. Those in opposition to this plan claim that it is not possible to reproduce the microclimatic conditions prevailing on the hill in Bhubaneshwar, although the soil in Bhubaneshwar is also laterite. Near the bank of the stream, the microclimatic conditions and other factors are different from those on the slopes.

An 11-member committee of the Orissa Assembly, headed by the Speaker, R.K. Das, who is also the President of Orissa Environmental Society, visited the site and presented a report. The report is confidential but the Speaker has assured the activists that it is in their favour.

The Ministry of Environment and Forests, has stated in a press release in September 1986 that it has told BALCO that permission for test mining and to deforest the hills will not be given under the Forest Conservation Act.

The mining authorities are trying different tactics. The Ministry of Mines has set up a based expert committee headed by Professor B.D. Nagchaudhri to study the environmental impact of the mining, bypassing the Ministry of Environment, and the committee is reported to have stated that these effects are manageable. It is not clear if the committee has looked into the social impact of the mining operations at all. The Ministry of Mines is trying its best to push the project through. Most of the journalists who have written articles on the issue, say that the decision now rests with the Prime Minister. If we have observed the local people's sentiments correctly, they are not going to give up. Their slogan is: "Beat us on our backs, but not on our bellies." They are united and clear about their purpose: BALCO must quit the area.

# ANNEXURE 1

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## Extracts from chapter VII of the report of the highlevel committee on environmental and ecological aspects of the Gandhamardan Bauxite Project, Orissa.

**Govt. of India, Deptt. of Mines**

7. 2 In discussing the question of obviating adverse effects of the project on the ecosystem, the committee felt that the issue may be largely of mitigation only. The Environmental Management Plan (EMP) has enunciated some of the actions which might contribute towards the same objective. In the study of the project certain gaps in the terms of reference came up. The Committee has identified some of them as relevant.

7. 3 In strip mining operations in any area there will be elements of deforestation or devegetation. The vital aspects to be considered are the scale of operation, the magnitude of possible damage and the restoration of land and vegetation. (i) It is clear that the extent of deforestation will involve 107 ha on the hill top which is thinly vegetated mining area. The effect of deforestation here will be insignificant. Out of a total forest cover of 20,000 ha along the hill slopes, only 55 ha will be affected by the mining, crushing and transporting of bauxite. (ii) If it is carried out with care and the environmental guidelines are observed to a large extent, the effects can be reduced. Allowing for the contention of the Department of Environment (DOE) regarding peripheral impact of mining spreading into larger areas (3 to 5 times the mines area), the adverse impact will decrease with distance. It may be pointed out that the resiliency of the ecological systems are usually such that recovery is speedy if the damage is kept within limits. Moreover, if the adjoining areas are ecologically better, the environmental system recovers due to continuing incursion of the flora (and fauna) into the damaged area. In this case, since the large hill slope area will remain available for sustenance of the existing hundreds of species of flora inclusive of medicinal herbs and plants, the disturbances and interference in a small area will be in the nature of a perturbation which will be restored over time if necessary precautions are strictly observed. The expert opinions including those of BSI are that none of the species are vulnerable, endangered, rare or specific to Gandhamardan Hill. In case of fauna, it is admitted that the larger and migrating mammals, have already been affected by the noise of blasting charges and other disturbances. Those that remain are bound to migrate from major portions of the plateau-top. Other smaller species are expected to

respond elastically to small or limited ecological changes and adjust to the new conditions. Further, it is recognised by experts that none of the faunal species are either vulnerable, endangered or specific to Gandhamardan Hill. The same arguments of a small area affected, compared to the larger existing forest cover can hold. It is felt that the forest can continue to serve as the habitat for the various floristic and faunistic species as long as human interference is kept limited to the hill top. Thus, the question of impact on the ecology may be said to be rather marginal if BALCO observes guidelines strictly. The issues have been raised in a general and hypothetical manner by DOE. Since no evidence has been presented nor was there any report of investigative visit to the area by its experts.

7. 4 The next important question is related to the impact of the project on the hydrological regime of the whole area around the hill range. The Committee has come to the firm conclusion that interference with land surface at the plateau-top in a limited area down to a maximum depth of 30 m where no ground water occurs even at a depth of 50-60 m, can have no effect on the flow of ephemeral or perennial water courses. Known seepages start only from around 100-150 m below the top. Here also the questions raised by DOE are merely hypothetical without the benefit of a case study or even reliable indirect evidence. Thus the Committee is unable to accept the DOE objection that the streams will dry up as the project develops. It can quite reasonably be expected that increased recharge at the mine-top area will follow restoration activities after mining. The Committee feels that this might augment capacity of the existing aquifers at the top of fractured Khondalite rocks, rather than diminish it.

7. 5 The opening of the road sections from Nrisinghanath temple to the hill top along a length of 9 km with numerous close-spaced hair-pin bends will definitely cause certain amount of destabilisation of slopes and induce soil erosion and siltation in the streams . . . Hence the road section has to be stabilised even if an alternate alignment is to be sought and found. Further, it is concluded that the operations on the mine road section and the hill top mine area cannot cause siltation and choking of all the major or perennial streams around the hills both to the north as well as to the south, if the abutments are properly stabilised. Only Khandejharan nala has got some susceptibility of siltation during the opening phase of the mine, till stabilisation measures are undertaken and completed.

7. 6 Blasting and resultant shock and vibration will generate varying degrees of noise and dust but it is not likely that there will be any permanent effect on the temple structures which are more than 3 km away from the proposed mine site. The collapse of Garuda pillar cannot be attributed to blasting. The temples are very old structures. The Nrisinghanath Nala is also inducing some bank erosion and thus the structures can be protected only by appropriate strengthening measures. The mine blasting as far as can be seen will not have any effect on them. The Committee is of the opinion that religious apprehensions of local people centre around the safety of the structures from blasting and choking of the sacred nalas of Kapildhara-Nrisinghanath due to siltation. The first apprehension is not real and the second one about siltation, can be mitigated by suitable measures. Noise and dust may interfere with pilgrimage practices related to the fairs during specific periods of the year. Perhaps measures could be devised to mitigate the effect of these.

7. 7 The Committee is aware of the fact that increased stress of human activity along the foot-hills, road sections and mine-top will have some impact on the environment. Strip mining on a given set of environs will have some effect as a necessary consequence of development efforts. Particularly, it is observed that DOE also has not given any cogent evidence on the degree of impact based on quantitative studies and a suitable cost-advantage-disadvantage matrix.

7. 8 The Committee has noted that the figure of 50,000 tribals having been affected is not correct . . . . The life-style of the whole population around the mine will not be irreversibly affected. This is not necessarily to the detriment of the people of the area if BALCO and Govt. of Orissa are fully alive to the risks and take adequate care.

7. 9 Uptil now 12 families are completely dispossessed of land and home. The Committee would recommend that these 12 families may be rehabilitated by giving employment in the BALCO set-up at GM project, at least one member from each of the nuclear families. This is a small percentage of the total local population. A point has been made that the sustenance levels of the tribals from forest produces will not be viable if the forests are disturbed. In this respect the contentions of the opponents of the project are not substantiated. Keeping the above points in view, the Committee is of the opinion that there are no adequate and genuine grounds for the non-clearance of the project by DOE. In fact, the Committee feels quite intrigued and concerned about the rationale and level of expert judgement of DOE to guide essential development projects. The Committee is aware that environmental problems are often integrated into planning and execution of such projects, while DOE seems in this case to be in an adversary position.

7.10 However, the Committee has recognised one basic issue. Except for providing cash compensation for the dispossessed and assuring employment of 300-400 local people, the project because of its very nature, will hardly give anything tangible in return to the local economy. Only certain peripheral and ancillary trade opportunities may be created. It is also observed that BALCO has failed signally in building up worthwhile public relations to gain the confidence of local people and develop further interactions so that people could be made aware of some of the benefits which would accrue directly or indirectly from the project. This failure of BALCO has been quite serious and it is noted that better and tactful handling of the local issues and sentiments would have paid better and more worthwhile dividends. In fact, at a meeting presided over by Shri R. Ganapathy, the Secretary, Deptt. of Mines in 1981, it was recommended to BALCO that concrete plans in preparation for exploiting Bauxite deposits should include welfare and economic development of the tribal people who will suffer on account of the mining and ancillary activities. BALCO has done little to implement that recommendation.

7.11 A strong public relations cell in BALCO stationed at Paikmal need be formed immediately. This cell would be strengthened with a rehabilitation office at Paikmal to work closely with the District Collector who could liaise with the Tribal Welfare Dept. so as to keep track of human relations.

7.12 The clearance of the project should not be delayed any further to avoid cost escalation. The need of the project based on ensuring a continuing availability of primary metal and demand projections in the ensuing decades, is well established.

7.21 Thus, the community and the company have gone their separate ways. There is no identification of community interests with that of the Company's activities. This has led to a hiatus which can only be healed with painstaking efforts, time and a great deal of care ... much of this work needs to be done in close relationship between the management and the people, so that not only do the results become visible but are also seen to be a part of the total management package.

7.22 The number of additional people that will enter this area in the wake of mining activities, would not only include those directly connected with BALCO work force but also brought in by secondary and tertiary activities, such as, commerce, education, etc. The ecological concept of the 'carrying capacity' of an area needs to be emphasised in the EMP so that the maximum number of people to be inducted into the area at any given time is well defined. This, as well as the population average over time should be estimated and incorporated in the EMP. This estimate would also allow calculation of the benefits specifically to the indigenous population of the area accruing from both mining and ancillary activities generated by BALCO as well as from secondary and tertiary activities. It will also help to design programmes to maximize benefits to the indigenous population and monitor them. It is therefore, imperative that the EMP be further redesigned and extended to include the concept of the community-industry interface.

7.25 One of the unfortunate aspects of surface mining and quarrying on the lives of the people, has been the concept of compensation for land taken away. This is a concept derived from British Law and its application often proves painful to the community of the people involved. Unfortunately, the Bureau of Public Enterprises has not redrafted its guidelines to include not only profitability, but also be sensitive to social cost and environmental damage. The compensation has often not been able to guard against pauperisation of uprooted people, particularly tribal people whose ability to look after themselves or guard against wrong advice willfully given for selfish aims is limited. The managements of the industry would do well not only to have a rehabilitation and counselling officer but also take occasional guidance of the District Collector so that the interests of the tribal people are fully safeguarded. It is proposed, therefore, that a more humane concept should be adopted. For example, it must be realised that compensation in terms of the volume of land taken away at current prices does not take into account the pain and distress arising from the loss of home, livelihood and anxiety. In essence it does not conform to the principles of equity. It is, therefore, our recommendation that compensation be replaced by full rehabilitation, a concept that is also in force but not generally implemented. We plead, therefore, that the practice of full rehabilitation of the people who are affected or deprived or their land and/or livelihood rather than full compensation, be adopted. For whilst it might, at first sight, appear to be unreasonably advantageous to the community at the expense of BALCO, it will not only meet the considerations of equity, but in the long run secure stable dividends for the Company through identification of common interests and fostering of a symbiotic association with the people of the region.

7.26 In conclusion, the Committee reiterates that so far as current assessment goes, the project can go ahead with strict enforcement and continued monitoring of the modified and updated Environmental Management Plan. There should not be cause for undue apprehension about any irreversible adverse impact of the project on the environment and ecology of Gandhamardan area.

## ANNEXURE 2

### Views of Deptt. of Environment

Annexure: 3.11
Dated 11.6.1986

### Environmental aspects of Gandhamardan Bauxite Project

### ENVIRONMENTAL ASPECTS

The major environmental issues requiring detailed consideration include:

- i. Impact on biological diversity.
- ii. Impact on water resources.
- iii. Impact on tribal population.
- iv. Impact on monuments and religious places.

Each of these aspects is briefly described below:

#### (i) Impact on biological diversity:

Gandhamardan Bauxite Project is located in a reserve forest which is extremely rich in biological diversity, both flora and fauna as well as medicinal and herbal plants of great economic value.

**FLORA:** The Gandhamardan range contains four different types of vegetation between the foothills (30 m) and the plateau (1000 m). The forest types are Dry Deciduous, Bamboo, Semi Evergreen and grass land. While the vegetation density on the plateau is between 0.2 to 0.3 it is found to be 0.5 and above on the slopes. Field survey of Botanical Survey of India shows that apart from more than 2700 species of flowering plants, the area also contains more than 150 species of medicinal plants and herbs. The survey also refers to the rare and interesting species of flora found in this region. Concentration of economic and rare plant species in this small area makes it imperative that it should be preserved even if some of the species found here may be available elsewhere too.

Bear, Palm Chivet, Jungle Cat, Leopard Cat, Leopard, Wild Boar, Mouse Deer, Sambar, Blue Bull, Indian Giant Squirrel, Indian Flying Fox and a variety of Bats and Vampires. Many of the species are covered under Schedule I and Schedule II. Birds found in the area include Peacock, Red Jungle Fowl, Serpent Eagle, Shikra, Disra, Sparrow Hawk, Teregrine Falcon, Great Pied Hornbill, Hill Myna, Large Indian Parakeet and many species of Eagle, Pigeon, Duck, Woodpecker, Oreol, Drongos and Finches, etc. Many of these birds are on the endangered list. Among the reptiles found are Indian Monitor, Python, Cobra and Russel's Viper.

#### (ii) Impact on Water Resources:

These hills are the origin of more than 150 springs which fall into 22 major streams and four water falls. Many of the perennial springs are perennial only because of the good vegetation cover at present. Drying up of water springs throughout the country due to destruction of forest cover is a well known phenomenon. Mining operations would result in deforestation which in turn would not only deplete the water resources but also result in serious pollution of whatever water is left. Denuded slopes will increase the silt load manifold with corresponding decrease in the recharging of the ground aquifers.

The local population in these hills as well as downstream is dependent for their water supply on these streams and have no alternative source when the streams get dried or polluted—the two possibilities that accompany mining operations. The changed hydrological cycle would not only adversely affect the irrigated cultivation but also have an impact on the vegetation and microclimate in the area.

The denuded slopes will contribute to a higher incidence of flash floods followed by drought.

#### (iii) Impact on Tribal Population:

The total population in the area is about 50,000 who are predominantly tribal and their main source of sustenance is the forest produce. They subsist on the traditionally tribal vocations of collecting medicinal herbs and Mahua flowers for medication and oil extraction, making bamboo baskets and collection of roots and tubers, supplemented with marginal agriculture. BALCO claims that no rehabilitation is required since none of the tribals are living in the lease hold area. Nevertheless, a very large proportion of the tribal population would be adversely affected because of the forest destruction which is the base of their sustenance. A handful of those provided employment as unskilled labour would be no better off because of the escalated cost of commodities in the project area. Local population, especially the tribals, are generally the main sufferers. In this case even the national offer for compensation and their welfare is missing.

#### (iv) Impact on Monuments & Religious Places:

The Gandhamardan hill range is a well known pilgrimage centre with sacred streams flowing. One of the streams, Kapildhara, is considered as sacred as the Ganges by the local people. Drying up of the streams and springs held sacred by the local people will be a major catastrophe. Two famous temples—Narsinghnath and Harishankar—built around the 11th century are important pilgrimage centres where annual Melas are held. The Garuda Pillar of the Narsinghnath temple collapsed in August, 85 and the roof of the temple's store house has developed cracks. It is significant that the pillar collapsed in the first rainy season after the preliminary works were commenced late in 1984. Local people, therefore, apprehend that their sacred temples would get destroyed after the operations are taken up in the full earnest.

## ENVIRONMENTAL COST

Even though the mining operations are limited to an area of 107 ha only and an additional forest area of 55 ha has been acquired for allied operations and works, the environmental degradation will take place over a much larger area. Past experience shows that forest area directly destroyed by mining operations varies between 3 to 5 times the area acquired for mining operations. Area damaged indirectly and due to the influx of labour force as well as concentration of economic activities is manifold.

Taking an average forest density of 0.6 and applying the guidelines issued by the Forestry Wing of the Department of Environment, the environmental cost of the loss of forest calculated Rs. 126.74 Lakhs per ha to accrue over a period of 50 years for a forest with a density 1.0 the environmental cost would be Rs. 76.044 lakhs per ha. Even at a conservative estimate of 500 ha of forest loss, the environmental cost alone comes to Rs. 380.22 crores.

This cost does not take into consideration the investment required for the following components:

(i) Provision of water for drinking and irrigation purposes to the affected population.
(ii) Increased incidence and intensity of flash floods and measures needed for their mitigation.
(iii) Reduction in agricultural output in the neighbouring region.
(iv) Compensation to the tribal population for their rehabilitation and occupational training.
(v) Shifting of the famous temples to locations acceptable to the local population.
(vi) Rehabilitation of flora and fauna especially the rare herbal and medicinal plants.

(The direct and indirect environmental cost would be simply prohibitive. The trauma of the local people due to loss of their home and hearth, the destruction of sacred places and the habitat of wildlife cannot be valued in terms of money.)

Of late, Gandhamardan Bauxite Project has attracted a great deal of coverage in the press. Representations have been received from eminent citizens, academicians and environmentalists urging that BALCO should not be allowed to start mining operations in the Gandhamardan Hills. The local population has been agitating against the project. A petition was also filed in the Orissa High Court.

## ENVIRONMENTAL MANAGEMENT PLAN

The salient features of the Environmental Management Plan of the Gandhamardan Bauxite Deposit has been prepared by the Department of Mines. Effectiveness of the proposed plan for maintaining ecological balance in the area needs to be examined and the following comments are offered:

(i) Open cast mining operations are the most damaging type of mining for the forest and water resources. Retaining a peripheral barrier would help in using the spillage of the waste to some extent. Mining operations, however, because of their very nature cannot be undertaken in air tight compartments. Direct and indirect destruction due to the mining operations, influx of labour force, concentration of development activities would have a cumulative impact on the destruction of forests, wildlife and environment of the area. The barrier suggested could be useful in an area which did not contain such rich biological diversity as is found in the Gandhamardan hills. The destruction already committed would become 100 fold due to the cumulative impact of the factors listed above.

Reclamation of mined land and the reclamation of hydrographic system proposed to be taken up for reclamation of mined pits and to control water pollution. The reclamation of a biologically rich area essentially suffers from the following draw-backs:

(a) The reclaimed area cannot be a suitable compensation for the loss of biologically rich forest which is destroyed through the development activity.
(b) There is a considerable time gap between the destruction and reclamation.
(c) Reclamation is done over a limited area whereas destruction extends over a much larger area.

Some steps have been proposed for controlling water pollution and it is premature to comment on their effectiveness. It is sure, however, that the denudation accompanying the mining operation would have an adverse effect on the hydrological cycle as well as the perennial streams and springs. Environmental issues can be dealt adequately only by adopting a holistic approach. The Project Authorities, however, have consistently adopted a narrow approach limited to the project boundaries. Therefore, there has been repeated emphasis by BALCO on the questionable findings of extremely limited "Studies" conducted to prove their stand. It has been stated, for example, that mining operations will not adversely affect the streams and springs whereas it is a universal phenomenon that deforestation of a given area invariably results in drying up of the springs and streams, especially in hilly areas. Mining operations all over the country have rendered the streams totally useless for providing drinking water and the population downstream has been forced to drink this water in the absence of any alternative. The Environmental Management Plan does not attempt an overall solution through a holistic approach.

(iii) The EMP also refers to steps proposed for dust control. Any comments on this aspect will also be premature at this stage.

THE E.M.P. IS TOTALLY SILENT ON THE IMPACT OF THE MINING OPERATIONS ON THE FLORA AND FAUNA, TRIBAL POPULATION, MONUMENTS AND THE OVERALL HYDROLOGICAL REGIME. THESE ARE EXTREMELY IMPORTANT ISSUES WHICH HAVE RECEIVED NO ATTENTION AT ALL.

## ANNEXURE 3

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**Memorandum presented to Mr. Rajiv Gandhi, Prime Minister of India, by the Gandhamardan Surakshya Yuva Parishad.**

Hon'ble Prime Minister of India,
NEW DELHI.

Mithapali,
6th May, 1987

Sub: Gandhamardan Problems and the Reported Recommendation of Dr. Nagchaudhri Committee.

Sir,

It has been reported in the newspapers that the committee set up by the Department of Mines, Government of India which was headed by Dr. B.D. Nagchaudhuri has recommended immediate resuming of bauxite mining by BALCO at Gandhamardan Hill in Orissa.

In this connection, we are to put forth the following few points for your kind information and sympathetic consideration:

1 (a) The three member committee, headed by Dr. B.D. Nagchaudhuri (which was euphemistically called the 'Environment Committee' by some people) was set up by the Department of Mines in the Ministry of Steel and Mines, Government of India vide its Notification No. 7/71/84-Met I dated 5th September, 1986 to study in depth—repeat study in depth—the impact of the proposed development of Gandhamardan Bauxite Project in Orissa on ecology and environment, including, interalia, on the waterfalls, streams, medicinal herbs, plants and temples. Further by a subsequent modified Notification dated 19th September, 1986 the word 'tribals' was inserted after the word 'temples'.

(b) It could be seen from the composition of the said committee that it did not include a botanist and archaeologist to which we raised objections earlier due to obvious reasons.

(c) As stipulated in the Notification mentioned above, the said committee should have taken steps to study the problem in depth and to comprehensively assess the environmental and ecological aspects of the project. We may point out here that the committee visited the spot twice (27th October, 1986 and 16th January, 1987) and the total time the committee spent on both the occasions was about three to four hours minus the lunch time. This includes coming down the slopes from the hill top, discussion with local people and agitation leaders, discussion with BALCO and government officials and half-an-hour visit to a site below the hill. We do not understand, and how can any reasonable mind accept, that the committee could have done in-depth study of the vast problems in such a short duration of stay. Moreover, the committee could not, perhaps, have gone beyond its terms of reference formulated by the Department of Mines which is very much interested to continue the controversial project.

2 (a) It also appeared in the newspapers in September last year that the Department of Environment (DOE), Government of India submitted a report pleading scrapping of the project altogether. The reasons and arguments given by DOE are incontrovertible and should have been accepted *in toto*. More so, after the considered opinion of the DOE there was no need of appointing another committee.

(b) The appointment of Dr. Nagchaudhuri Committee itself was a clever move by the Department of Mines (DOM) to scuttle the report of DOE and to push through its case.

(c) As mentioned earlier, the DOM is very much interested to continue the controversial project and it is expected that it would move heaven and earth to manoeuvre a decision in its favour. Hence it is a clear case of differing opinions on the part of DOE and DOM. In such a situation, as the DOE is the only authority competent and entrusted with the responsibility of looking into the environmental and ecological aspects of the problems, its opinion should supercede any other opinion given by any other department or any committee set up by it.

3. Moreover, as it concerns the lives of thousands of Harijans and tribals, the ministry dealing with them, the Archaeological Survey of India, the Botanical Survey of India and the Ministry of Tourism should also have been involved in the process to make a comprehensive study as all these issues are involved.

4. We must state here categorically that the fate of the movement to protect the ecology and environment of Gandhamardan does not depend on the report of one department of the government or the other. The Harijans and tribals and the common people know from their own experiences born out of struggle for existence that the Gandhamardan and its deep forest, where once the sunshine could not penetrate, is the source of their livelihood, culture, faith and history. So many genuine and peaceful movements of the people in past have been crushed and

only time will tell what would happen to this one; but we must reiterate, on behalf of the people, that they are determined to protect the Gandhamardan—their eternal mother—at any cost.

In view of the aforesaid facts and circumstances, we, on behalf the Gandhamardan Surakshya Yuva Parishad, appeal to you kindly to take a final decision to scrap the Gandhamardan Bauxite Project of BALCO without any further loss of time. The policy of Government of India enunciated by you and your own well considered views and pronouncements on the question of ecology and environment are under challenge from a section who are determined to prove that a handful of bauxite is more important than mankind and its survival.

Yours faithfully,
B.S. Hota
Adviser
Gandhamardan Surakshya
Yuva Parishad
Mithapali,
P.O. Paikhmal
Dist. Sambalpur (Orissa)

# Women against mining: A struggle for survival

RADHA BHATT

The development policy that we have today is largely exploitative of nature. It is impossible to conserve and protect our environment in the existing circumstances. To achieve some kind of stable change, it is important that we alter the whole concept of development. Our livelihoods and our very being are dependent on nature. The question is—what kind of relationship should we maintain with nature? Should we learn to live in peace and harmony with it, or should we attempt to conquer nature and live with it in constant conflict?

The origin of today's economic policy lies in the Industrial Revolution of the 18th century—the basis of which was to extract, appropriate and exploit. This is what current development is all about. Basically, this is a Western concept which has spread to the East, swamping its original culture.

India's culture says that nature is our mother. We are nature's children. The child feeds on the mother, but does not destroy her. In ancient India, rivers were called mothers. Trees, earth and animals were considered gods. Now, with our Western ideas, we laugh with scorn at such ancient thoughts.

Within the short span of two centuries, we have used up our natural resources so indiscriminately and to such an extent that now the very existence of humankind is threatened and we have to encounter the fury of nature. If we realise this, there is still hope.

Where should this kind of consciousness come from? Most of us think that this kind of awareness should come from the common public, that they should be the ones to be educated and alerted about the dangers to the environment. Public awareness is a concept that we commonly connected with environmental protection, but this awareness should rightly begin with the leaders and higher authorities of every country. Unfortunately, they are often the ones responsible for their country's environmental degradation.

It should now be clear that an environmentalist's job is not just to create minor changes, but to start a grassroots revolution which shakes the very fundamentals of the exploitative development policy, and changes it altogether.

The struggle and confrontation between development and environment is very evident in India today. Building dams on rivers is development. Frantic mining is development. Cutting down of trees to provide wood for luxury goods is development. All this is considered progress, but actually it is an affront to humanity and an outrage against nature.

Consider the region called Malla Danpur which touches the snowline and is the source of the Saryu and Pindar rivers. Mountains of the area stand at a gradient of 80 degrees. This region falls within a geodynamic fault zone, which means that the mountains are very sensitive. Recently, in Kafli Kamera, four houses were buried under a landslide and its inhabitants took shelter in other houses. Their fields and grazing lands were swept away into the Saryu. In the Saryu watershed area, landslides have spread over 300 ha of land, and 21,000 trees have been destroyed. This has caused the Saryu river to flood its banks, destroying 15 watermills and five bridges. Nearby villages, Khalpatta Gasi and Mikhila have been partly deserted, with villagers moving into the forest above, and taking shelter in small huts.

This is not the only story of this kind. Some four kilometres away from Kafli Kamera, the village of Karmi suffered the same plight in July 1983. Eight houses were swept away; 36 people were killed along with a number of animals; and, many bridges, water mills and about 49 km of the valley were destroyed; and on the other side of Kafli Kamera, about three kilometres away, another village Suring, also suffered the same fate in 1957. Some 31 km away seven people were killed due to landslides in 1979 and property worth Rs.1 crore destroyed. In the Saryu watershed itself, in another valley, the village of Baghar was buried in a landslide only a few years ago. Inspite of this history of natural calamities in this sensitive zone, in 1984, the UP Government leased out 85 ha of land to an industrialist for quarrying soapstone in Chaurasthal, a beautiful site located in the middle of all these villages.

Mining activities, on the one hand swallowed up the common grazing land of the two villages, Pethi and Chaura and, on the other, the source of drinking water of the small hamlet of Pethi dried up. The women of these villages, already overburdened with work, now had the additional burden of carrying water down from a height of two kilometres every day. The reason for allowing the mining was that it would provide employment for the people of this backward area. It did not matter to the policy makers whether the 2,000 people of these villages would face peril from landslides, whether their economic base was going to be threatened, and whether the sensitive zone, once disturbed, would leave the whole of north India open to the fury of floods.

All these mining activities—which are supposed to be for development—are swallowing up a lot of grazing land. Today the amount of grazing land available in Almora district is just about a quarter of what is needed for the livestock. Yet in Kumaon, there are at least 50 such mining and mining-related activities going on. This is encouraged by the government, which leases out the grazing lands of various villages for such activities. The grazing land and forests have all along belonged to the villagers, but now the right to their land has been taken over by the Uttar Pradesh government. The government has, by securing a 'no objection certificate' from the head of the panchayat, appropriated all the rights of the villagers. The direct impact is felt by the women who form the backbone of the agricultural economy. The government's development policy has snatched away their basic rights and totally disrupted their means of livelihood. A famous geologist of Uttarakhand, Dr. K.S. Valdiya, has rightly said: "The cause for environmental destruction is two-fold. Firstly, there is less land and more people to support. Secondly, the stomach is small and hunger is large. We are using more and more resources. As long as the measure of development is money and the aim of our economic policy is overutilisation of natural resources, the concept of environment protection will be a big farce."

Inspite of the success of the Chipko movement, several people are arguing against the ban on forest felling. Ironically, people now are more attracted by the new kind of development.

They want roads starting from their homes to the peaks of the Himalaya.

The construction of roads in hilly regions creates enormous environmental problems. The debris collected per kilometre of road per year on the Tanakpur-Tawaghat motor road is around 740 cubic metres. Even assuming the average figure to be only 550 cubic metres per km per year, and the fact that the total motor road length in the Himalaya is 44,000 km means that something like 24.2 million cubic metres of debris is generated on the hill roads every year.

This debris finds its way into the rivers, increasing erosion and raising the level of the river bed at the rate of 15cm to 30 cm per annum. In the future, when the level of the water in the river rises during the monsoon season, many villages will be innundated. The plains will always be under the threat of floods.

An average farmer in the hills owns about 0.1 ha to 0.2 ha of land. The debris from mines and roads comes into the fields and destroys even this basic means of livelihood. Under such circumstances, the chances of bringing the poor farmers even slightly above the poverty line seem remote.

Even though the rate of topsoil formation in the tropics is extremely slow, this topsoil is being squandered through mismanagement. The organic matter content of the soil has been reduced to such an extent that its water retention capacity has become quite weak. This has affected the seasonal volume of the rivers. During the monsoons, the rivers are said to have a thousand times more water than in the dry season.

Under such conditions how can we expect our agricultural economy to thrive? Is it not alarming that even after 40 years of independence we are not able to give our people an assurance of a stable economy? Instead we are uprooting all the age old conventional resources which have sustained us for so long.

Some ten years ago, we started a new programme. My organisation, Lakshmi Ashram, has been working with hill women and children since 1946. We have a centre for education and training of women. We were also involved for ten to 12 years in the prohibition movement.

Our main work is organising women. Given the opportunity, women should be able to solve their problems by themselves. But because women in the hills have always been considered second class citizens, they feel extremely depressed. Women often say, 'Oh, we are like cattle.' So, with such women, who feel so unimportant in society, it was a bit difficult to give them the confidence to solve their own problems.

But over the last ten years, this has begun to change. With the Chipko movement making people conscious about forests, we have come to notice another type of environmental destruction through mining.

Open mining of different minerals is quite common in the Himalaya, even though the whole region is geologically very sensitive. Once the green cover is cut, the soil rushes down to the river. Afterwards, people also migrate out of the region. The women remain at home and are today the backbone of the whole system based on farming. This farming is not for commercial purposes but for subsistence. The women are the focal point of agriculture in the whole Himalayan region.

After the Chipko movement started, the government was forced to start thinking about forest conservation. Contractors were discouraged from cutting trees or getting contracts for felling trees. However, vested interests discovered another way. Contractors turned to open mining in the Himalaya, mostly of soapstone and magnesite.

There is a village called Khirakot in Kosi valley, which is very near Lakshmi Ashram. The women there asked themselves in 1975: why do we not stop cutting trees in this dying forest and leave it for two or three years to regenerate? It was not the men who had thought of this solution but the women who were facing a problem of fuel and fodder shortage. They did not sit down for a meeting with a chairperson or anything like that, but while returning from the forest in groups of ten to 12, they used to talk about the problem. Once they had decided, they preserved the forest so well that in two years the trees were tall and green everywhere.

But in 1977 a lease was sanctioned to a contractor by the district authorities for mining soapstone. The women were very disappointed but they did not know how to stop it. When they asked their menfolk, the men said, "It is difficult, because this contractor has money and then he has the backing of the government and we can not do anything." The women kept quiet and in two years, they realised that the debris from this soapstone was flowing into the rivers.

They again raised their voice: "Our children are getting sick because of this polluted water, and we can not stop it." But again the men said, "No the mine is not the reason. We will bring medicines for the children." After two or three months, the rains came and the debris descended onto the villagers' fertile, cultivated land. For the women who had to work in the fields, this was the last straw on the camel's back. First their springs dried up and now their grazing lands and forests were getting destroyed. The fields were also getting affected by the trains of mules carrying soapstone. They said, "Now, we will leave the men aside and start working against this mine." They went home and told their men, "If you do not do anything, we are going to stop this mine, because it is not only our hill that is going to be destroyed but it is a question of bread for our next generation. We have to look after this land, our houses, and our pastures."

For two and a half years, these women and about 80 per cent of the men campaigned. They decided to march towards the factory. There was a small mining unit and they went quietly. They did not have any slogans, just one or two banners, proclaiming that this is destruction. They came home and held a small meeting to talk about the problem.

The next day there was a summons from the court for 22 people from the village who had picketed the factory. These 22 were the poorest of the village who were not even in the procession. The villagers came together—the women were stronger than the men—and decided, "We have to fight this in court." The men asked, "From where will we get the money?" The women went from door to door and the money came. In two and a half years, the villagers spent Rs. 10,000 and fought the case. At the same time, they launched a people's movement. The two things went together—fighting the court case and the popular movement. Finally, the villagers of Khirakot succeeded and the mine was stopped in 1981.

But the villagers did not stop. They said, "No, it is not that we want to stop this mine, we want to save our pasture land, our forests and our farming land. How can we reclaim the quarries and make our forests prosper?" So they reclaimed 100 feet wide quarries and planted trees. The whole forest was soon so dense that within two years a leopard came to stay inside the forest and in one month killed 19 cows. The women asked, "What do we do now?" The forest department people suggested that they cut down the lower branches, because the forest was so dense. Then the leopard will not get a place to hide.

There are 150 families in Khirakot and Khakoli villages and 150 women would assemble at one place to do both community and personal work. They formed groups of ten, and 15 groups would cut some 6,000 headloads for fuel.

Khirakot decided to start handicrafts for the women. They wanted to start in winter, because they thought there would be more time then. They decided that they would start cottage industries, so that when women were free, they would do this work. In this way the villagers have started small cottage industries to boost their economy and generate a richer environment based on the Gandhian principles of village independence, decentralised development and dignity.

This idea of stopping mining started from Khirakot and soon its people wanted to tell other people also about the many different mines in Kumaon. The Khirakot mine owner, when his lease was cancelled, simply went to another place. The women went to Lakshmi Ashram and pleaded, "Please go to this other place because we have heard that the contractor has gone there and our sisters will face the same kind of difficulty." Since then we have been to many places. In some places we have scored success but elsewhere, these have eluded us. The contractors are better organised these days and they are trying their best to break the growing movement.

In Pithoragarh, there is a magnesite mine. The women there said that all the fodder gets covered with dust. "When we cut grass the whole day, our clothes, faces and hands get completely black. The cattle don't eat the grass; they ignore it till they are very hungry." When we organised a camp, the men were against the movement. They said, "This is a question of our employment. We are going to get employment from this mine." One man, who was a central figure in the camp, was beaten up and had to be admitted to hospital.

The women kept quiet. For two years nothing was heard from them. Everybody said, "There is no sign of life or organisation in those people. Everybody thinks that the contractor is nice because he is building a temple in the village." Recently, I met the man who had been beaten up, and he said, "My confidence is low. But the people are telling me that their cows have started dying because of the dust. They have been consuming this dust for two years." Women tell us to do something now. It is not the concern of the men in the area to maintain the cattle; it is the women's concern. They treat cattle like one of their family members. Sometimes a woman will ignore her mother who is ill, but first of all will go to see to her calf and milch buffalo. So these threats to their cattle affect not only the economy, but the very hearts of these women.

We have had some success in the Malla Danpur area again which is 7,500 ft high, very close to the snowline, and on the trekking route to the Pindari glacier. It is a very sensitive area with a geological fault. The area has been ravaged by landslides. In 1984, the local people heard that a lease was going to be sanctioned for soapstone mining in a village called Suring and started agitating against it. They even went to Lucknow, the state capital, and pleaded against the sanction of any mining lease in the area. In 1957, there was a big landslide and they had thought that the whole earth was shuddering. Some 47 people and many animals had died in the landslide. Ever since, the lower side of the village, which slopes towards the river, has been sliding every year. But policy makers in Lucknow ignored their pleas. They sent many petitions to the government. "Please shift us from here; we want to go to a stable place; we do not want to live here because it is the question of our children's lives. The lives of our cattle and our own lives." The government simply replied that it did not have any place to rehabilitate them elsewhere.

Yet they went ahead and allowed the soapstone mine just over their heads, about one and a half km away from the village, up the hill. The people protested but the miners did not listen. In 1985, the mine was started and the people decided to do something. The women came forward and said, "It is a question of life and death. Where are we going to send our cows to graze? The mined area was the grazing land of four villages." The women and men together walked for 40 km to present a memorandum to the Sub-Divisional Magistrate. Eventually, the women started a hunger strike for 11 days, which forced the Sub-Divisional Magistrate to place a stay order on the mine. Since then, mining has stopped. The people decided to go beyond the stopping of the mine and they have now started to plant trees and build check dams in the small ravines.

The whole movement against the mining grew around a temple with a goddess. The work for regenerating the land began with crackers and other objects which the people usually take for *puja*. They first worshipped the goddess and then went in a procession, with drums, to the barren land where they were going to build a protective wall against cattle. They worshipped the land and the soil, like they do when they build their own houses.

They performed *puja* with the help of a Brahmin priest: It was as if they were entering a sacred world!

This is how environmental action is proceeding in Uttarakhand. It is not merely to stop the mining, but to preserve a way of life. What is needed most is to give confidence and strength to the people, because till now, people always looked to the government to solve their problems. People now just write applications to the government. They must direct their energies towards themselves. They must manage these forests and pasture lands themselves. They are ready for it because they have learnt that the government has failed to reach out to them in these remote hills.

In one village, a woman recently told us, "We have to solve our problems but we have to start to reform ourselves. There are people who are encroaching on forest land. We have to demolish all those encroachments. Only we can do it—not the District Magistrate, nor the forest department." These poor people can survive only if they reach this stage of self-management.

Fishermen launch a loaded catamaran. FAO/MC COMTE

# Troubled waters: Mechanisation and Kerala's fisherfolk

THOMAS KOCHERRY
AND
THANKAPPAN ACHARI

Ecological and environmental parameters have an important bearing on fisheries. Periodic changes in ocean currents, water temperature and oxygen layers occurring due to natural phenomena, affect the natural balance, resulting in fluctuations of the fishery resource. However, indiscriminate human intervention, through the adoption of superefficient technology beyond sustainable limits, can also precipitate resource depletion.

There is a third dimension to this problem — pollution caused by direct or indirect dumping of excessive quantities of domestic sewage, industrial effluents, and toxic materials into the rivers and sea. With technological advances the impact of effluents and toxics has been considerably aggravated the world over, particularly in the Third World where effective controls are as yet elusive.

The Californian sardine and the herring and mackerel of the North Sea and Britain are typical examples where destructive practices like the use of trawlers have led to partial or complete depletion.

It is suspected that intensive fishing, combined with an environmental aberration in the form of the 'El Nino' current, have been responsible for the catastrophic destruction of the Peruvian anchovetta in the early seventies. Another example is the Japanese sardine, whose catch failed because of the recruitment failure under fishing pressure. Environmental degradation poses a host of problems, both short and long term and of local and national interest.

Traditional artisanal fisherfolk in coastal Kerala have been fighting a relentless battle for over a decade against mechanised fishing vessels such as trawlers and purse-seiners. For the fisherfolk, this is a struggle for their very survival since their livelihood is being directly threatened by these rival and powerful fishing methods. It was only in the last few years, however, that fisherfolk also began to articulate the problem of ecological damage caused by inshore mechanised fishing. Overfishing and destruction of fish breeding on the sea bed led to severe depletion of marine stocks. Because of the efforts of a range of non-governmental organisations, journalists, politicians and social workers, there is a growing awareness of the shrinking of marine fishery resources.

## Exploitation of fishery resources

The total amount of fish available nationally within the Exclusive Economic Zone of India is estimated at 4.5 million tonnes. The potential within the inshore zone of 50 m depth, where artisanal craft and mechanised boats operate, is around 2.26 million tonnes. Against this, about 1.72 million tonnes is currently caught per year, out of which as much as 99 per cent is from inshore areas. Accordingly, up to 75 per cent of the inshore potential is presently exploited, leaving little scope for a rise in overall fish production from the inshore sea.

It should be noted that fisheries development has not been uniform in all the states. It depends on the infrastructure and emphasis given by government plans. Kerala fisheries, aided and abetted by an Indo-Norwegian project and the state government, took an early lead in the development of mechanised fishing, particularly shrimp trawling. Karnataka forged ahead in the introduction of purse-seiners. In 1975, there were 2,105 mechanised boats in Kerala and 1,235 boats in Karnataka. The number increased to 3,038 and 2,004, respectively in 1980. While Kerala's mechanised fleet stagnated at 3,000 in 1984-85, other states went ahead with more mechanised boats. In the meantime, motorisation of country craft also gathered momentum, reaching 23,000 in 1986.

A perusal of the data demonstrates that states like Kerala, Maharashtra and Tamil Nadu more or less fully exploit their Maximum Sustainable Yield (MSY). Indeed, the MSY need not be assumed to be consistently accurate. But this could be a meaningful approximation. In Kerala, the state had exceeded its potential MSY by 1971-75. The increase in the number of mechanised boats during 1976-80 did not affect aggregate production. Production reached the lowest 0.274 million tonnes in 1981, but slowly picked up to 0.425 million tonnes in 1984. But in 1985, according to the state department of fisheries, production once again slumped to 0.333 million tonnes. The obvious implication is that the marine fish production in Kerala has been lagging behind at 0.4 million tonnes since the middle of the seventies.

Although Maharashtra had exceeded its production over the MSY in 1971-75, there was a further increase in 1976-80 unlike in Kerala. This phenomenon is partly explained by the fact that the neighbouring states of Gujarat and Karnataka had been exploiting only half their potential, and it may be that this has worked to the advantage of Maharashtra. But production in 1981-84 declined.

## Mechanisation vs indigenous techniques

Overfishing has been closely associated with modern fishing techniques, comprising of shrimp trawling and purse-seining. Kerala and Karnataka provide evidence of this. Fisherfolk and environmentalists were not at all bothered about resources as long as techniques remained the same and the catch stood much below the sustainable mark.

The fisherfolk of Kerala have been fishing in inshore waters for thousands of years and have evolved methods, craft and gear suited to their environment and the variety of fish. Their nets have different meshes to suit different species, whereas the mechanised vessels use a single net which traps fish indiscriminately, including hatchlings and roe. The artisanal fishing methods are, therefore, not only tuned to the environment but also do minimum damage to the stock. At the same time it must be noted that such fishing in Kerala has never been a purely subsistence activity for consumption. The fisherfolk have hereditarily sold their fish to inland areas and also through traders to various other parts of the country and abroad.

The fisherfolk became conscious of the ecological consequences of mechanised fishing only when they found that they were squeezed out of their share of the fish catch. Between 1969-

71 and 1980-82, the share of fish production in the artisanal sector in Kerala declined from 0.335 million tonnes to 0.167 million tonnes in 1980-82, the decrease being about 50 per cent.

The studies conducted by the Central Marine Fisheries Research Institute (CMFRI) on prawns in Sakthikulangara-Neendakara show that between 1973 and 1980, the catch per unit effort declined from 82.6 kg/hour to 7.6 kg/hour. In a study of the period, the total production of prawns in Kerala declined from 86,000 tonnes (1975) to 22,400 tonnes (1981).

Even when the overall fish production in Kerala improved to 0.425 million tonnes in 1984, production of prawns was only 31,100 tonnes. As regards the prawns of Mangalore, a group of scientists from the CMFRI said, "It is interesting to note that the best catch of prawns and catch rate was obtained during 1973-74, when the effort was only moderate. Further addition of effort during subsequent years had not resulted in any better yield. On the contrary, the catches and the rates showed a declining trend except for an improvement of the fishery during 1977-78. The catch had surpassed the MSY during 1973-74, and from 1972-73 onwards the fishing effort also exceeded the optimum level. All these indicate some overfishing in the limited areas of operation.

"The decrease in the annual mean length of the various species during the present observation is also suggestive of a depletionary trend since the continuous increase in the effort over the years led to heavy fishing or intensive exploitation of the stock in which the chances of new recruits to grow to larger sizes in the fishing grounds were very much limited. In other words, the prawns were overfished at the virgin level."

Fisherfolk contend that heavy accessories like wooden boards and iron chains, tend to destroy living organisms and tiny plants on the sea bed. Besides, there is large scale capture of roe and hatchlings in the course of trawling as the mesh size is 20 mm or even less.

Although the scientists admit that there is overfishing, they do not want to confess that there is a biological threat to prawns. From the fact that the catch per unit of effort and the size of prawns have fallen since the middle of the 1970s in Kerala, Karnataka and Goa, it can be rightly concluded that prawns in the southwest coast of India are getting depleted. This falling trend suggests biological, more than economic, overfishing. Even with a low catch, the operations could be economic if the power is high enough to cover the costs and yield a profit. But if

biological overfishing of prawns is continued, it will lead to an ecological catastrophe in the long run, from which we cannot recover easily.

There has been overcapitalisation and wasteful investment in shrimp trawling. According to the Kalawar Committee Report (1985), the optimal number of trawling boats to catch prawn resources beyond the 10 fathom range for Kerala is 1,145, suggesting that about 56 per cent of the trawlers were not required to bring in the same quantity of fish. In other words, a total of around Rs. 20 crore invested on a fleet of 1,485 trawlers had been sheer waste. The economy would have benefited had this capital been utilised in areas of higher priority. What is true of Kerala is equally applicable to Karnataka, Goa and Maharashtra. In the fisheries sector as a whole, there has been very high waste for want of proper appraisal and planning. The private sector has been largely responsible for this predicament.

The introduction of a large number of purse-seiners along the southwest coast (368 in Karnataka, 54 in Kerala and 135 in Goa) since the middle of the 1970s has taken place in a bid to increase the catches of sardine and mackerel. Each vessel cost about Rs. 5 lakh initially and increased to Rs. 7 lakh by the early 1980s.

In Kerala, purse-seining did not have any visible impact. Despite 54 purse-seiners operating there, the production of sardine and mackerel declined. In Karnataka, the average annual production of oil sardine showed an increase of 26 per cent between the two periods. However, the production of mackerel declined slightly. Interestingly, even without the large fleet of nearly 400 purse-seiners in Karnataka, the artisanal craft with their passive gear could peak higher catches during the pre-purse-seine period. Goa's experience is a repetition of Karnataka's.

At an average rate of Rs. 6 lakh per purse-seiner, the country has invested over Rs. 33 crore for the new technology. But it has failed to bring in any increase in the aggregate landings. Even without this investment, India would not have been worse off. On the other hand, this technology has competed with artisanal craft and gear for the same species and space, and deprived these fish workers of their regular catches. Bulk landings at centres of purse-seining have reduced fish prices as well.

While recommending purse-seining as the most efficient technique for catching oil sardine and mackerel, the UNDP/FAO Pelagic Project in Cochin, points to a pertinent issue: "The question of whether it will adversely affect the traditional artisanal fisheries by reducing the abundance of fish which will eventually create direct clashes on the inshore fishing grounds." The social implications apprehended by the UNDP/FAO Project have already surfaced over the years. There have been frequent conflicts between artisanal fish workers and purse-seiner crews, resulting in loss of equipment and casualties.

But much change has taken place in the technology used for sardine. Over 350 purse-seiners are reported to be fishing since the middle of the 1970s, which together have a capacity to fish the entire potential of sardines in the country totally displacing artisanal fisheries.

Of late, the emphasis is on motorisation of country craft. The initial success has promoted both the public and private sector to go in for motorisation in a big way. By 1986, the number of motorised units had gone up to 23,000; this trend is still picking up. But nobody seems to have been bothered about fish resource limits, at least in states where exploitation has exceeded the sustainable potential. Ultimately, the unbridled motorisation will boomerang on fish workers leading to uneconomic returns, unproductive investment and mounting indebtedness.

## Crisis compounded by pollution

The resource crisis caused by high cost technology has been compounded by an increase in water pollution. High levels of pollution exist along vast stretches of the major rivers, including the Yamuna, Sone near Dalmianagar, Damodar, Godavari, Bhadra, Cauvery, Periyar, Rushikulya (in Orissa) and Hooghly. Large quantities of untreated sewage, industrial effluents, including DDT wastes, and chemicals are daily dumped into the rivers. These result in fish kills and ecological disaster, besides extensive water pollution.

According to the Central Inland Fisheries Research Institute (CIFRI), "Eight industrial units in Durgapur pump wastes that are equivalent to the sewage from a city of one million population. Fish kills are a common occurrence in summer. The (Hooghly) river is heading towards ecological disaster."

The effect of estuarine pollution of the Hooghly on fishing has been the subject of a number of studies by scientists at the CIFRI. A recent study has noted that in the 158 km length from Nabadwip to Baj Baj, the average annual yield of fish in the unpolluted and polluted zones was 159 kg and 26 kg per hectare, respectively.

In Kerala, the state government has built a spillway and the new barrage in an effort to keep under control the tidal encroachment of saline water into Kuttanad, the rice bowl of the state. The farmers have taken to high-yielding varieties of rice and use pesticides in plenty. According to the department of agriculture, Kuttanad uses twice the amount of pesticides per tonne of rice that the rest of the state consumes.

The catchment area of the Periyar river has experienced extensive deforestation over the past two decades. The National Remote Sensing Agency, the Centre for Earth Science Studies and several other organisations carried out an environmental impact study of Idukki Project on the river Periyar. They found heavy soil erosion in the catchment area. Fishing also might suffer in a considerably large area of the Vembanad Lake and probably in the ocean nearby.

## Conclusion

No one can be against technological improvement as a means of augmenting production. But what must be opposed is the blind adoption of modern technology, which is taken advantage of by a few capitalist entrepreneurs to the detriment of the vast majority of fish workers and of the natural resource itself. In a country like India, where the tide of unemployment is raging high and capital is scarce, technological improvement should benefit the people. As we have seen, neither trawling nor purse-seining has been of any assistance to the vast majority of fish workers. Instead modern technology has competed with them, depriving the poor fish workers of even their meagre existence. It has also caused depletion of natural resources and environmental disequilibrium.

In addition to the catastrophe precipitated by the unbridled operation of high cost technology, is the incessant disposal of industrial effluents, untreated or partially treated sewage, and other toxic materials. The major river systems in the country are polluted, resulting in large scale fish kills and destruction of aquatic life. Indiscriminate stake net fishing in the estuaries and construction of salt water barriers further damage the brackish water as well as marine prawn fishery. As far as the inshore and inland fisheries are concerned, the time has come when we have to accord top priority for the proper conservation and management of the country's fishery resources.

## India's marine fisherfolk: Unending struggle

Facing increasing violation of their fishing rights and unemployment due to mechanisation and overfishing, India's traditional marine fisherfolk have been left with no option but to organise themselves for a fight for survival. Beginning with a purely spontaneous expression of outrage, the fisherfolks' struggle has come a long way to become a well organised and properly researched campaign.

The starting point of the agitation was the formation in 1978, of the National Forum for Catamaran and Country Boat Fishermen and Marine Wealth, a representative body of 13 major fisherfolks' unions, at the initiative of the Goan Fisherfolks' Organisation. These unions, later coordinated by the National Fishermen's Forum, have been protesting and struggling against the destructive fishing of more than 16,000 trawlers and 5,000 purse-seiners. In Kerala, violent clashes took place at sea between the traditional fisherfolk and the trawlers, but the state government insisted on viewing it merely as a law and order problem and refused to take steps to enquire into the causes of the clashes. The fisherfolk pressed for their demands — an exclusive fishing zone of 20 km from the coast for small and artisanal fisherfolk; deployment of coast guards to patrol the zone and enforce the law; protection of the sea from pollution; and a halt to evacuation of fisherfolk from the seashore in the name of tourism and beautification. A nationwide campaign was launched in 1978, resulting in promises by the central government to draft a new marine bill.

Though the concerned minister agreed to look into the fisherfolks' grievances, nothing happened. The National Forum again agitated in different places. In 1979, the Forum picketed the Parliament house and submitted a model Fishing Regulations Bill. Finally, the central government requested the concerned state governments to enact sufficient legal measures to protect traditional fisherfolk. By 1983, four maritime states had enacted the Marine Fishing Regulations Act, prohibiting purse-seiners and other large vessels from operating within 22 km of the shore. Trawlers were permitted to operate only 5 to 10 km from the shore. But these laws have rarely been enforced.

In 1981, the first major agitation of the fisherfolk in Kerala, led by the Kerala Independent Fishermen's Federation (KIFF), had only one major demand — ban monsoon trawling. The monsoons are the main spawning season for fish. After first agreeing to this demand, the government later retracted under pressure from the trawling lobby. This again led to agitations, hunger strikes, picketing of the national highways, railway lines and airports, and massive demonstrations and *dharnas*. After the Babu Paul Commission was set up to look into the issue, the agitation was called off. This commission, made up of fisherfolk, scientists and government officials, submitted its report in late 1982. It suggested 13 measures to be immediately implemented to conserve fish resources. The members of the commission agreed on all the suggestions but they were divided on the issue of monsoon trawling. While the fisherfolk were in favour of the ban, the scientists and government representatives thought it unnecessary.

In 1982-83, the Kerala fisherfolk united with other fisherfolk across the country and staged joint agitations. In 1984, the Kerala fisherfolk organised a mass agitation on their own. They put forth 17 demands, which included the implementation of the Babu Paul Commission suggestions, a ban on monsoon trawling, and participation of fishermen in village welfare societies. The agitation began on Labour Day — May 1, 1984 — with *dharnas* and demonstrations at the village level and later, hunger strikes by leaders at various district headquarters. The active participation of a section of the clergy added a new and controversial dimension to the agitation.

As the Chief Minister refused to have any dialogue with the fishermen, the struggle intensified. Trawlers which violated the fishing regulations were caught and brought to shore by the agitating fisherfolk. Rail traffic and national highways were again picketed throughout the state. In view of the repression unleashed by the authorities, public opinion swelled in favour of the agitating fisherfolk. Eventually, the government decided to hold talks with the fisherfolk and appointed the Kalawar Commission. The agitation was called off after 52 days.

The KIFF spearheaded education and conscientisation programmes, and initiated the formation of fisherfolks' cooperatives. The first cooperative was started in Mariandad by Bishop Perreira, himself a member of the fisherfolk community. While the cooperatives met with varying degrees of financial success, they served the essential purpose of educating the fisherfolk into a wide range of issues.

They helped the fisherfolk to organise their expenditure so that bank loans were smoothly repaid, made available good fishing tackle at reasonable prices, and, in the face of growing shortages of softwood required for building country boats, began developing cheaper alternative materials. They are also dealing with the problems of pollution and indebtedness caused by the use of outboard motors, a device to which many fisherfolk are now turning in order to boost their sagging catches.

Today, most of the cooperatives have either joined, or are affiliated to, the South Indian Federation of Fisherfolk Societies (SIFFS). SIFFS is an umbrella organisation that covers three district federations of fisherfolks' societies — some 45 societies and 6,000 fisherfolk. The total annual fish sales turnover of the societies exceeds Rs. 30,000.

The government has been viewing the fisherfolks' agitation with a narrowed eye. Incensed by the way the fisherfolk have been scientifically and systematically using government data to expose its pro-trawler bias, the government has ordered all government fisheries and marine research bodies not to publish any statistics on fish catches.

Spurred by an announcement from the central agriculture ministry about its intention to issue open licences to industrialists and capitalists for import of big trawlers under charter, the fisherfolk staged a nation-wide agitation in March, 1987 and presented the following charter of demands:

1. Enact and implement the Marine Fishing Regulation Act in all the coastal states.
2. Ban trawling and purse-seining upto 20 kms in territorial waters.
3. No untreated effluents should be discharged into the water.
4. Ban trawling and purse-seining at night and during the monsoons.
5. Minimum mesh size for purse-seine and trawl nets should be 35 mm.
6. Promote deep sea fishing in public and cooperative sectors with the help of fisherfolk. Stop joint ventures and issuing licenses.
7. We demand that the right to own and use fishing implements in territorial waters be given exclusively to fisherfolk.
8. Stop evicting fisherfolk in the name of tourism and development.
9. Legislate and implement labour laws in processing plants and mechanised boats.
10. Exemption from excise duties on imported outboard engines and supply quality kerosene at reasonable price.
11. Reorient fisheries research in cognisance of the traditional skills and science of the fisherfolk.
12. Control export of marine products to save the fisherfolk and consumers.
13. Introduce schemes to supply implements to fisherfolk and old age pension.
14. Inland fisherfolk should be assisted and fully incorporated in all aquaculture and fish culture programmes.
15. Title deeds for the house sites where they reside, be given to fisherfolk.

(Based on: *In the shoes of the fishermen* by V. Iyengar and *History of the NFF* (excerpts from the report the NFF 1977-86) by T. Kocherry.)

The following measures seem relevant for consideration of implementation:

**A. Development of inshore fisheries**

(i) A proper assessment of the inshore resources and fixation of an optimum number of craft and gear combinations of non-motorised and motorised country craft, mechanised gill netters and limited number of trawling boats should be carried out as a priority programme at the national level. Until this is done, introduction of new craft and gear for inshore fisheries exploitation should be temporarily suspended at least in states where the MSY is tapped to the saturation point.

(ii) The coastal waters upto 10 fathoms deep may be reserved for the exclusive use of artisanal units all along the coast of India.

(iii) Night trawling should be completely banned and a quota system of catches for each trawling boat be stipulated so that indiscriminate exploitation of the resource is prevented beyond the 10 fathom zone.

(iv) Purse-seining should be totally prohibited in the inshore waters of the country.

(v) Research and development support for small scale fisheries must be evolved with the full integration of modern science with fish workers' traditional knowledge so that the proper management of the resource is ensured for the benefit of the masses. Increased fish production would be meaningful only if growth ensures distributive justice for fish workers.

(vi) Unbridled freedom in the hands of private capitalists to exploit the resources will spell danger to the ecology and environment affecting natural resources. Hence, over a period of time, the fish workers should be made the owners of the craft and gear operating in the inshore waters. An aquarian reform on the model of the agrarian reforms may be the aim of the government in this regard, the basic objectives being conservation of ecology and environment besides sustained production.

(vii) Destructive fishing like the use of small size mesh whether at the cod end of trawls, purse-seines or indigenous gear, must be controlled effectively, lest it should impoverish the fishery wealth and upset the ecological balance.

(viii) A concerted effort should be made to provide a regular feedback of relevant data to the fish workers. Efforts should also be made to develop a consciousness among the workers regarding the nature of resources and needs for management.

### B. Development of offshore and deep sea resources

In the development of offshore and deep sea resources, the application of modern technology like purse-seining, trawling and long lining is indeed imperative. Here again, fish workers with the necessary orientation and training would fit in best as deck hands and skippers. This will usher in new vistas of employment and income to the fish workers to improve the quality of their life.

### C. Pollution control

( i) Indiscriminate dumping of toxic materials, industrial effluents and sewage must be prevented by taking appropriate measures. The pollution control boards in the states must be strengthened with greater powers for penal action against offenders.

(ii) National awareness on the need for preserving the environment from pollution and destruction should be created. It is laudable that such a campaign has been launched throughout the country. But we have to traverse a long way before we can make any impact in achieving our goal. Until such time, the struggle of the working class will have to continue in a bid to protect the environment. Science and technology should come to the aid of the people to protect resources, ecology and environment and guarantee sustained production.

### Table 1
### Progress of mechanisation and marine fish production

| | MSY within the 50m zone ** | No. of mech. boats 1975 | Total catches 1971-75 ** | No. of mech. boats 1980 | Total catches 1976-80 ** | No. of mech. boats 1985 | Total catches 1981-84 ** |
|---|---|---|---|---|---|---|---|
| Gujarat | 389 | — | 124<br>(32) | 3413 | 192<br>(49) | 3488 | 220<br>(37) |
| Maharashtra | 153 | — | 221<br>(144) | 4718 | 328<br>(214) | 4557 | 304<br>(199) |
| Goa | 85 | — | 27<br>(32) | 908 | 27<br>(32) | 250 | 49<br>(58) |
| Karnataka | 238 | 1232 | 90<br>(38) | 2004 | 117<br>(49) | 2967 | 133<br>(56) |
| Kerala | 377 | 2105 | 406<br>(108) | 3038 | 332<br>(88) | 3000 | 352<br>(93) |
| Tamil Nadu Pondicherry | 279 | — | 188<br>(67) | 2920 | 228<br>(82) | 2934 | 265<br>(95) |
| Andhra Pradesh | 199 | — | 116<br>(58) | 580 | 104<br>(52) | 856 | 134<br>(67) |
| Orissa | 341 | — | 26<br>(5) | 469 | 35<br>(10) | 636 | 45<br>(13) |
| West Bengal | 199 | — | — | 740 | 12<br>(6) | 927 | 32<br>(16) |
| All* | 2260 | | 1200<br>(53) | 19013 | 1331<br>(59) | 20000 | 1542<br>(68) |

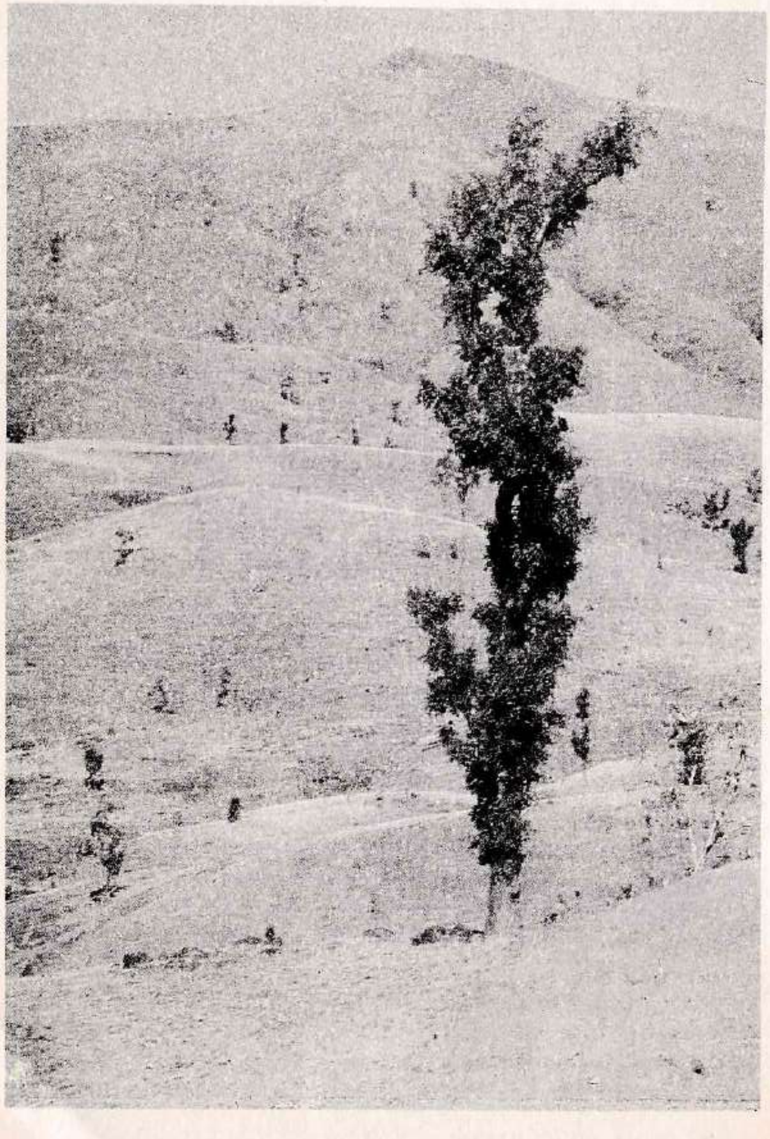
*Inclusive of Andamans & Lakshadweep

**Thousand tonnes

***Figures in brackets indicate percentage of MSY

### Table 2
### Magnitude of investment in the development of purse-seine fishery on the southwest coast.

| State | No. of purse-seiners | Investment (Rs. lakhs) | |
|---|---|---|---|
| | | Per vessel | All vessels |
| Karnataka | 368 | 6.00 | 2208.00 |
| Kerala | 54 | 6.00 | 324.00 |
| Goa | 135 | 6.00 | 810.00 |
| | 577 | | 3342.00 |



# Between need and greed— the wasting of India; the greening of India

ANIL AGARWAL

The environment is not just pretty trees and tigers, threatened plants and ecosystems. It is literally the entity on which we all subsist, and on which our entire agricultural and industrial development depends.

Yet India's environment today presents a depressing sight. India is rapidly becoming a vast wasteland. Between one-third to one-half of the country is fast deteriorating into a desert.

Unlike the situation in the Western world, the question of environment destruction here is not an issue related to the *quality of life* but to the very survival of millions of poor people.

## I. The state of our environment

### *Land degradation*

Let us take a look at the state of our lands. According to available official figures, between 100 million and 150 million hectares of land area is rapidly turning into a desert. This is an enormous amount of land, equivalent to one-third to one-half of the entire land area of India. Even the rate of degradation is extremely rapid. Every year 2.5 mha — that is, about one per cent of India's land area — turns into wasteland. Some 1.5 mha turn barren ever year because of deforestation and another 1 mha are affected by a variety of factors including mining, overgrazing, waterlogging, soil salinisation and cultivation of marginal lands.

In 1985-86, it was officially claimed that some 1.5 mha were afforested. If indeed this was true we could take some consolation in the fact that if we are losing 2.5 mha every year, we are at least reclaiming 1.5 mha. But if we go into the mechanics of how this figure was calculated, we find that tree survival rates have not been taken into account. Thus, we can say that most optimistically speaking, the real afforestation rate will not be more than 0.5 mha — a third of what was claimed. This makes the comparison of what we are losing every year — 2.5 mha —and regaining — 0.5 mha — rather frightening. We are creating a desert at five times the rate we are reclaiming it.

And this can actually be seen today travelling around the country. At the tail end of the Vindhyachal range, touching Maharashtra and Gujarat, lies the district of Jhabua. I have never seen a more devastated environment. The entire area looks like a lunar landscape barren, rocky, with no trees or even a blade of grass for miles and miles. And erosion is setting in in a big way. There is no earthly reason that Jhabua district should look like this. It gets rainfall in the range of 800 mm. With this kind of rainfall, there should be lush forests in the area. Indeed there were such forests less than 40 years ago. But once the area became deforested, it soon acquired this desolate character.

The trouble is that it is not just the Vindhyachal range that today presents this kind of barren look. The same is true of every hill and mountain range and plateau region in the country: the Himalaya, Eastern Ghats, Western Ghats, Malwa plateau, Chotanagpur plateau, Deccan plateau, and what not. Hardly any hill around Pune has any trees on it. Recently we travelled through the Deccan plateau from Pune to Jalna and we never saw a hill with trees.

The Aravalis today present an equally barren picture. So does the Chotanagpur plateau even though it is a relatively high rainfall area. Even Meghalaya today has been deforested to an amazing extent. In the world's wettest place, Cherrapunji, there are vast tracts of total barrenness. The Garo hills present a bleak picture. Here people laugh and say that unlike central India, we do not measure rainfall in millimetres. we measure it in metres. One can imagine what this torrential rain will do to the deforested hill slopes here.

However, the potential of India's lands to support life is extraordinary. In the Rajasthan desert, we found a good green cover growing even on sand dunes. In fact, we came across an interesting story about sand dunes near Jaisalmer. This sand dune is the nearest one to Jaisalmer and it is a big tourist attraction. Tourists go to see this sand dune on buses, on camels and

on all kinds of vehicles. The forest department has planted half the sand dune with trees on it and now this part looks like a normal hill with a small forest on it. So the tourist department has protested. "Please stop", it said, "otherwise where will the tourists go?" But the point is that even sand dunes in this country have an extraordinary potential to support life.

This is because there are three elements of nature which we have in abundance. The first is sunlight, and we have lots of it. The second is water and again we have lots of it, if only we can learn to hold it properly. And then we have excellent soils. These three elements, combined properly, can become a source of life. In fact, according to FAO, if there is any country in the world which has the potential to feed half of Asia's population today, it is India.

But if not combined properly, these same elements can become a source of death. The high sunlight and high temperatures will desiccate the soil, and the high rainfall will wash the soil away. And in a country like ours, experts say this degradation can take place at a rate faster than any other part of the world.

I saw this recently in a drastic way in a place in Midnapore. Here was a *sal* forest that had been cut once but was coppicing well because it was away from human interference. But as we moved 100 metres from there, we saw tree cutting had started. Another 100-odd metres from there we saw the tree growth was more stunted and the soil more exposed. Still further away the tree cover had almost disappeared and the soil was totally exposed. Another 100-odd metres from there the soil was totally barren. Much of this land had been given away under land reforms programmes in West Bengal in the late 1960s but we were told by the local peasants that they had rarely grown any crops on this land. The reason is that the soil has become laterised. It is now like a hard pan on which hardly anything will grow. Finally, the rain lashes this barren land and the erosion starts. The same land which could support rich life, now lies totally devastated. This destruction is almost like the Dance of Shiva and it can take place extremely rapidly.

The Prime Minister, Shri Rajiv Gandhi has said that we should aim to afforest some five million hectares of land every year. The trouble is that much of the deforested land is so poor now that it is going to pose superhuman challenge to afforest it. Travelling across the Deccan Plateau recently, we asked the local foresters why we cannot have trees back on the barren hills. They said that many of these hills now have a soil cover less than six inches deep. "Forget trees, we will be lucky if we can get even grasses back on them." The few trees that we see on these hills are all in little gullies, that is, depressions where some soil has accumulated. We were shown a spot in Ahmednagar district with a 20-year old neem plantation. Neem is a hardy species for drought-prone areas but still the results were very poor because of the poor soil base.

In the town of Pimpri, near Pune, the local town development authority had tried to regreen a hill but to do so it had to carry 350 truckloads of riverbed soil back on to the hill, literally reversing the process set in by nature which had washed away the soil from the hill into the river bed.

In Bankura, again we came across vast tracts of barren, rocky land. On this land, the experts had decreed that no trees could be grown, especially the *Arjuna terminalia*, useful for sericulture. But the tribal women's cooperative here was very keen to plant trees. So they cleared away the rocks, dug up the pits and planted the trees. But the soil base was so poor that it could hardly hold any water. So the women go down the hill to a pond almost half a kilometre away to bring water to the plants every day.

Such lands can be afforested again. It is not as if the situation has gone beyond the ambit of human will and effort. But in many cases, it will be nothing short of a superhuman effort and as time goes by, unless we reverse the current trends fast, the effort required will become ever greater, almost verging on the impossible.

Another aspect of the land degradation problem is the rate of soil erosion. On an average, every hectare of land loses 20 tonnes of topsoil every year. Every six months more topsoil gets washed away than has been used to build all the brick houses across the country. Near Dehra Dun is a bridge called the Kaulagarh bridge. Fifty years ago this bridge was 50 feet above the river bed and its entire arch could be seen. Today the entire arch is under the river bed. Because of the heavy soil erosion from the catchment area of this stream, caused by mining and deforestation, the river bed has risen at the rate of literally one foot every year over the last 50 years. This is definitely a dramatic case. But if river beds are going to rise fast, there is no way that we can control floods. The Sivaliks, being a young mountain range, are particulaly vulnerable to soil erosion. Here the rain can wash away whole hillsides in one downpour.

The beautiful picture of the Himalaya that all of us love to see is of lofty peaks full of snow. The beautiful Himalaya is indeed full of life. But few notice what the modern human being is doing to the Himalaya. Roads have spliced the heart of the mountains of our irrigated lands can go out of cultivation because of soil salinity and waterlogging.

The water pollution problem is getting alarming all over the country. Pictures of effluent waters from chemical factories in the town of Ambernath near Bombay are so full of colour that one would think that it is a technicolour soft drink. These waters are today polluting the entire area. The hundreds of tanneries in Ambur, in the North Arcot district of Tamil Nadu are situated next to the Palar river, and all of them dump their highly toxic wastes into the river.

Another aspect of our water management system is the heavy reliance on dams. We have invested over Rs. 10,000 crores in 1500-odd large dams. Yet returns from this investment are low because average yields from irrigated lands remain less than two tonnes per hectare. Meanwhile, the flood-prone area has doubled from 20 million to 40 million hectares. Dams can do little to control floods unless accompanied with afforestation. In fact, dams have displaced and uprooted millions of people and these people in the past were often settled on forest lands leading to further deforestation. But now as we are keen to protect our forest lands, it is an open question where we can resettle such displaced people.

### *Air pollution*

Air pollution levels in most Indian cities are going up and in several cases exceed recommended limits. The Bhopal disaster has made us further aware of the high risk environment we live in. But normally when we speak of air pollution we think in terms of big cities like Bombay, Calcutta, Delhi and Madras.

We often think that the problem will be solved by pushing industries into backward areas. But once an industry is set up in a backward area, there are almost no controls on it. The media doesn't care, pollution control agencies don't care and even big city-based environmentalists don't care. For instance, the Patratu thermal power station,70 kms away from the town of Ranchi, belches smoke. But no one has even talked of controlling pollution from this power station.

On the way to Ranchi, our train stopped at the town of

Khalari. A small cement plant there puts out so much cement that it is all over — on the platform, on trees which were dead, on trees which are yet to die, all along the tracks and on vegetation far and wide. Interestingly, this cement plant is not owned by a and caused enormous soil erosion. The rubble from the road is simply pushed down and in the process many farmers lose their fields, and they are never compensated because their lands have, technically, not been acquired.

Landslides cause a lot of soil erosion in the Himalaya. Years ago, I remember an old woman involved in the Chipko Movement had told me "The terror of the tiger has gone. But it has now been replaced by the terror of the landslide". Landslides are common in the Garhwal region. These landslides not only destroy trees but also many fields turning these poor farmers into landless people.

Yet another cause of land degradatation is mining. More than half the national mining output comes from 40 contiguous districts of central and eastern India, the tribal heartland of the country. And we know tribals are people so dependent on natural forests for their survival. Therefore, we can imagine how badly mining in India affects tribal people, apart from causing soil erosion and deforestation.

A poster outside Dehra Dun says : "Welcome to Dehra Dun — the city of hydrated lime." But Dehra Dun, situated in the Sivaliks, today witnesses some of the most badly scarred mountains in India because of limestone quarrying. Finally, all this quarrying will tell on the water supply of the town. It is these hills and forests which provide water to the streams.

### *Water degradation*

We have talked at some length about the deteriorating land situation. Let us now take a look at the situation with respect to water. It is said that 70 per cent of all the available surface water in India is polluted, though I often wonder where is the remaining 30 per cent. Even the high altitude lakes have not been spared from pollution.

The condition of groundwater is equally disturbing. In many places the groundwater table is going down, intensifying drought conditions and leaving the poor person's dug well high and dry. We are cutting forests and reducing recharge of water to the groundwater reservoirs. At the same time, we are pumping out large quantities of groundwater.

In many other places, which have got canal irrigation systems, the water table is going up, as in large parts of Haryana and Punjab, creating serious problems of waterlogging and soil salinisation. According to experts, between a quarter to one half small firm but the country's largest cement company — the Associated Cement Company — headed by a socially concerned industrialist, Nani Palkhiwala. If such companies can pollute in such an unrestrained manner, we can imagine what other companies will do.

## II. Effect of environmental destruction on the people

These are but some highlights of the rapidly deteriorating environment. We can still ask how does this affect us. I would like to submit that environmental destruction in India threatens the very survival of millions of poor people. In fact, India is too poor a country to neglect its environment — the survival base of its poor citizens, indeed their fundamental right. The worst sufferers of the environmental degradation are the country's poor. I say this because poor people do not, by definition, benefit much from the Gross National Product. They survive because of what they get from what I like to call, if I may be permitted to use a rhetorical phrase, the Gross Nature Product.

The reason for this is simple. If we look at the lives of the rural households we will find that almost all their basic survival needs are biomass-based, that is, based on products obtained from plants and animals. And most of these products are collected freely from the immediate environment. Food is biomass; fodder is biomass; most of the fuels like firewood, cowdung, and crop residues that poor people use are all biomass, even building materials like timber and thatch are biomass. I can add to this list many artisanal raw materials like wood, bamboo and leather, which are also biomass. Water is another crucial need for survival, which is not biomass but it is biomass-related. In our monsoon type climate, if the forest disappears, the water also disappears. When the dry season comes, the stream dries up, the pond silts up and the dug well dries up.

Thus, life across rural India is biomass-dependent. And this can be seen anywhere in rural India. When a crop is harvested, every part of the crop is used—some for food, some for fodder, some for fuel, and some for thatching purposes. Even the money that rural people often earn is by bringing biomass-products to the town. Straw goes to towns for sale in the Sundarbans on boats. In other parts of India, bullock carts are used, but the phenomenon is the same.

Let us take a look at the lives of women in a situation of growing environmental destruction. In all ecologically devasted areas life is becoming unbearable, and the worst affected are women. As the environment degrades, women have to spend an extraordinary amount of time foraging for basic household needs like fuel, fodder and water. It does not matter whether they are young, old or pregnant. There are no Sundays or holidays. It is a job that takes place, day after weary day, year after weary year.

Energy surveys in the country show that in an average semi-arid village, a woman walks as much as 1400 kms a year—the distance from Delhi to Calcutta—to collect firewood alone. In addition she goes out to collect fodder and water, works in the fields and at home, cooks food and bears babies. The situation is much worse in hill and mountain regions like the Himalaya and in the arid regions of Rajasthan and Gujarat. Some ecologists say we are reaching the carrying capacity of our lands but to my mind we are literally reaching the limit of the 'carrying capacities' of our women. The work burden that is emerging on our women because of environmental destruction is mind-boggling.

As firewood becomes scarce, people scrounge around for cowdung—a very valuable source of manure which literally goes up in smoke. But today even cowdung is scarce. Our animal population is extremely undernourished. With no fodder, the animals produce little dung. In a tribal village near Udaipur we found a practice to stake claim on this free resource. If a stone is put in the middle of the cowdung, that means that the dung has been claimed, now it can be collected only by the person who left the stone.

Given the energy crisis, people improvise in a thousand different ways to collect this very basic need of cooking energy. In many places crop residues like *arhar* sticks and cotton sticks are being used increasingly for fuel. But with a difference. Crop residues unlike most trees and weeds are a private resource. They belong to the person who owns the land. And today they are being used as a bargaining counter by the landed. In Jalna district in Maharashtra, where cotton sticks are an important fuel, we were told that landowners had refused to increase farm wages by threatening to stop giving the free supply of cotton sticks to the labourers. In many other places today, crop wastes are given in place of wages. People have to work not only for their food but also their fuel. When people cannot get anything to burn, they turn to any kind of *kachra* they can find like the roots of sugar cane.

With the original vegetation gone, new weeds are taking over the ground. Lantana, Parthenium, and Eupatorium are three exotics which cannot be eaten by animals and are spreading like wildfire across the country. They provide no fodder and, in fact, even supress the grass growth. But they have become today the only source of fuel for millions in the country. In tribal Bihar, Lantana is stored for use as fuel. But the Lantana shrub is so thorny that cutting it is no easy task, it lacerates the hands of the poor person who has to collect it, driven by the need to use it.

There is an an interesting story here. When in the early 1970s the Planning Commission had estimated the fuelwood needs of rural India, they had calculated that the annual requirement was of the order of 100 million tonnes of wood. The forest departments only produced 10 million tonnes. The yawning gap of 90 million tonnes, it was assumed, came from illicit felling of trees by people. But we believe that people do not steal wood from state forests in such a large measure. Weeds make up for a major part of the deficit.

In West Bengal I found a truly frightening picture. Here the devastation is so complete that even walking miles does not help. So people have no option but to burn leaves. Every morning women walk to the nearby forest and literally sweep the ground with brooms to collect every single fallen leaf to take home. But these bundles of leaves, after hours of backbreaking work, will disappear in cooking just one meal. Leaves are such poor quality fuel that women are forced to shove in leaves every minute to keep the fire going. The situation in Bengal is so bad that we found a four month old plantation of *Acacia auriculiformis*, renamed *akashmoni* by Tagore, being swept clean by young girls.

An environmental problem which is truly unique to women is one that most of us have never even considered. In Gopeshwar town, headquarters of Chamoli district in U.P. Himalaya, all around the town is barren treeless land, except for a small patch of dense oak forest—almost like an oasis in the desert. This forest survives only because women of Gopeshwar village take turns ever day to keep a strict watch over the forest and prevent even their own village women from taking away any wood or grass. The prime reason for a protection is not fuel and fodder, but privacy. It is the only place they can go to for their ablutions.

If you are a woman in dry parched surroundings with no tree in sight then you have no choice but to hold your urge all day until dusk. This has, as one study from Bangladesh shows, enormous impact on the health of the women.

There is another heartrending social and ecological drama going on in Himalayan villages. As the soil becomes poor and cannot sustain its people any more, men migrate to look for work. The women are left behind and are forced to undertake more and more agricultural work and at the same time, more effort is needed to collect firewood and fodder because of receding forests.

Something will soon have to give as women will find it humanly impossible to cope. One day, the dung which is traditionally used as manure in the Himalayan villages will be burnt. And then even the productivity of the fragile mountain soils will collapse. Then women too will have no option but to leave like their men.

As if this extraordinary work burden of women is not enough, the smoke pollution that they are subjected to when they cook, greatly adds to their health problems. In barely three hours of cooking, women inhale pollutants more than any industrial worker would be exposed to in any industry in eight working hours.

The problem is worse in cold regions where ventilation is reduced. In such places, soot can even be seen on children's faces. A survey in Nepal showed that two-thirds of the deaths of infants was because of respiratory diseases. The same may be true in the high mountainous regions of our country.

### III. Causes of environmental destruction

We have discussed just some of the environmental problems and their impact. We can ask why they occur.

Waste and want are the two greatest problems of our time. But whose waste and want contributes most to environmental destruction?

I would like to submit that it is the affluent who are the biggest polluters and destroyers of the environment, and not the poor—especially those affluent people who will benefit most from the urban–industrial system.

The demand for natural resources generated by the consumption of the rich is the biggest cause of environmental destruction, and it is their wastes mainly that contribute to the global pollution load. Urban ecosystems, that is, towns and cities, attract natural resources from their surrounding hinterland for their use almost like giant vacuum cleaners. This extraction invariably leaves a trail of environmental destruction.

This can happen in a variety ways. For example,

- through deforestation by paper and rayon mills,
- through mining,
- through construction of dams to feed electricity for the big cities,
- through extensive use of water and pollution of our rivers like the Ganga by our cities and industries,
- through air pollution,
- through brick building,
- through construction of roads,
- through encroachments on good agricultural land, etc.

We have found that the *trigger* for environmental destruction even in the rural areas usually arises out of demands of the rich benefitting from the urban–industrial system. This happens also on a global scale. Many of us have heard about the butter mountains of Europe. But few of us know that a large part of the animal feed needed to keep the cattle of Europe so well-fed comes from the countries of the Third World—from Asia, from India, from Africa, and from South America.

The rich areas of Europe, North America and Japan maintain their consumption through the exploitation of our lands. But what the urban-industrial system of the rich countries does to our environment in the Third World, the urban-industrial system of India does to the environment of our own rural hinterland.

Nearly ten years ago there was a demonstration of poor basket weavers in front of the Karnataka assembly complaining that it was becoming impossible to get bamboo to carry on their craft. When Professor Madhav Gadgil of the Indian Institute of Science in Bangalore was asked to look into the problem, he first found that the price of bamboo in the open market to which the poor basket weaver had to go, was something like Rs. 1200 a tonne. But the paper mills in Karnataka were being supplied bamboo from the state's forests at only Rs. 15 a tonne. Thus, the difference between the price that the poor person was paying and the rich industrial system was paying was just incredible. Secondly, he found that the paper mills had steadily overexploited the bamboo forests in the state and were now getting their bamboo more and more from other states like Tamil Nadu and Madhya Pradesh and occasionally from as far away as Meghalaya.

The urban industrial system has acquired this extremely *extensive* pattern of consumption—first destroy the natural resources nearest your own town or factory and then move on to exploit a distant area.

An excellent example of global resource colonisation is the behaviour of Japanese timber companies. Having destroyed the forests of the Philippines, they have now moved on to Indonesia and Papua New Guinea and have set their eyes on the Amazon Basin.

Similarly, in India, all eyes of industrialists are now on the remaining forested frontiers of India: Bastar, the Northeast and the Andaman and Nicobar Islands. Major public sector paper mills are now coming up in the Northeast.

This same thing can be seen in the way Delhi consumes firewood. Over 10 per cent of all railway wagons that come into Delhi carry firewood. Nearly 80 per cent of the firewood consumed in Delhi came until recently from Madhya Pradesh. But as firewood prices started rising in M.P. because of increasing deforestation, the state government there put a ban on the export of firewood. Firewood prices in Delhi are today amongst the highest in the world.

Mangroves are forests found in coastal areas and these forests are extremely important for maintaining a balance in coastal ecology. But in the Sundarbans, which has some of the world's most beautiful mangrove forests, we saw many boats carrying mangrove wood to firewood stalls. And all this firewood was meant for the towns and cities of West Bengal.

Cities affect the hinterland also by their demand for food. In Khasi hills in Meghalaya, an area known for its heavy rainfall, we can see potato being grown along steep slopes. Potato fetches money and it is grown extensively.

In Himachal Pradesh, apples are grown extensively but every hectare of apple orchards needs three hectares of pine forests because apples have to be crated before they can be packed off to towns and cities.

Recently, I was told that tomato production, which is also being promoted in our Himalayan states, is three times worse than apple production. Every hectare of tomato plants needs ten

hectares of pine forests in Himachal Pradesh because every plant needs a stick and tomatoes, being more fragile, need smaller crates.

Thus, we see that urban-industrial needs lead to enormous environmental destruction and pollution. But it is the poor who are then forced to live in the degraded hinterland. In their bid to eke out an existence, the poor are left with no alternative but to exploit their environment even more intensively, setting into motion extremely vicious cycles which result in further breakdown of both nature and society.

- The forests of Jhabua did not disappear because of the poor. But now that the forests have gone, the tribals here are farming even hilltops and steep slopes. There is heavy soil erosion and productivity is abysmal. As productivity falls, more hilltops and forest land get encroached upon for cultivation and migration increases to the towns. The same is true in Jodhpur where the poor farm sand dunes. The soil gets loosened up and the dry summer winds then take away tonnes of sand.
- Keeping goats is yet another common practice in degraded areas. From the herder's point of view goats are a good investment. They survive better than cows in a hostile environment but they degrade the environment even faster.
- Finally the poor also join the rich in selling away their ecological infrastructure for survival. All over India we have found that whenever and wherever landlessness or joblessness increases, and if there is a forest nearby, the poor start selling wood in the towns.

This activity called 'headloading' is practised by at least three to four million people, making it the biggest source of employment in the energy sector today. But it is not a very paying proposition. It is an employment of desperation. It often takes two to three days to collect a 20-30 kg of headload of firewood from the forest and take it to the town on buses or trains. The maximum these people will earn is Rs. 6-10 in two days and a third of this will be lost in bribing the forest guard and the railway guard.

When the drought comes and money is short, people cut trees for their survival—at a time when the ecological infrastructure needs to be preserved most. A 150-year old mahua tree can get sold away for less than Rs. 500.

The ultimate result of environmental destruction is increased drought—little water, little fodder, and few sources of livelihood. All ecologically sensitive areas are rapidly turning into human-made deserts. Even Kerala with two monsoons and over 3000 mm rainfall has begun to face unprecendented droughts in the 1980s.

For the last few years we have been witnessing massive droughts across the country. In Jodhpur, we saw women plucking out their crop merely to save it for fodder even in the month of September. The country has realised that it is not enough to have large stocks of foodgrains in the country but we must also have fodder banks. Fodder has been taken all the way from Punjab to Karnataka to feed starving cattle.

While walking in the degraded Aravalis, a friend said : "Today the entire survival base of the villages is going away :

- the soil is going away;
- the water does not stay back; and
- the trees are also going away.

Finally, the people, especially the men, will also go away. The women will stay back to face the ecological destruction, the shortage of basic survival biomass needs, and the drought. Not surprisingly, they turn up in the greatest number to break stones in famine relief programmes.

India has not yet become an Ethiopia only because its vast and extremely rich Indo-Gangetic plains and delta areas continue to yield, despite all kinds of environmental mismanagement (deforestation, declining water table, increasing waterlogging, salinisation and ravinification).

Food, and increasingly fodder, are being transported over large distances to meet the needs of the famine-stricken people. The 21st century could easily bear witness to vast tracts of desert-like lands surrounding oases of prosperous agricultural regions. Even these may not last long. The Indo-Gangetic plains cannot survive without the tree support of the Himalaya. The poor living in ecologically devastated areas are today supported more by the National Rural Employment Programme, Rural Landless Employment Guarantee Programme, Employment Guarantee Scheme, etc. than by their own rural ecosystems.

As rural ecosystems degrade and the very survival of our villages becomes impossible, ecological refugees—or rural-urban migrants as they are often called—stream into the last frontier—the town and the city—to become permanent settlers and make slums. Seasonal migration, as a first step to permanent migration, is rapidly increasingly in all ecologically devastated areas. The problem of environmental destruction begins with the consumption of town dwellers and ends in the towns.

As urban ecosystems swell with incoming refugees, urban management becomes an impossible task. More Indians will join urban India than rural India in the last 15 years of this century. By then, India will possess the world's largest urban population—over 300 million people—and managing this population will pose an immense challenge.

The final question, therefore, is 'what do we do'?

### IV. An action plan for environment

Protecting the environment is now enshrined in our Constitution as a fundamental duty of every citizen. But saving and enriching our environment is not going to be an easy task. No environmentalist in this country can even claim to know all the answers. Therefore, what I intend to present now is a 7-point action programme based on suggestions that have been made by various environmentalists, social workers, friends in voluntary agencies and even several people in the government. The action programme aims not just at conserving and improving the environment but also at improving the quality of our economic and social development.

### Environmental Agenda 1

***Protection of natural resources from irrational pressure of development***

To my mind, the first point on an environmentalist's agenda must be to protect whatever is left of our air, water, land and forest resources. This means that our various acts like the Forest Conservation Act, the Air Pollution Control Act, the Water Pollution Control Act and the new Environment Protection Act must all be strictly implemented overriding all political and business pressures.

The acts could definitely be strengthened but more important than that is to implement them strictly. And this is the major responsibility of the government agencies. But where government agencies fail to take up the cudgels on behalf of the environment, individual citizens and citizens' groups must raise public opinion and use the acts available to them.

There is a growing number of environmental groups in the country. In Kerala, for instance, the Kerala Sastra Sahitya Parishad organises street plays to create environmental consciousness and it played a key role in saying the unique Silent Valley from being dammed. A number of such things can be done. Every citizen has a role to play in saving the environment.

### Environmental Agenda 2

### *Environmentally-sound planning built around concepts of equity and sustainability*

Protection is only one per cent of India's environmental problem. In a country like ours it is vital that we improve the standards of living of the vast majority of our people. Therefore, more important than protection, is to learn how we can use our natural resources at a higher level of productivity but also in a manner that the increased production is sustainable. This, to my mind, is the biggest challenge we face.

In other words, with environmental consciousness growing, there are now three objectives before the country's development process: Growth; Equity; and, Sustainability.

The new objective of sustainability demands, firstly, that planning must be decentralised because the country's ecosystems are numerous and diverse. India is nothing more than a collection of diverse ecosystems. Planning for each ecosystem must proceed differently. We cannot plan for the high Himalayas as we plan for the Sunderbans, Deccan Plateau or the Northeast. Development cannot function like a monolithic juggernaut.

Secondly, sustainability demands that before we start planning for the economic development of an area and making investments in it, we must develop an idea of the *'sustainable economic future'* of that area. This will call, most of all, for good land-use planning for every agroecological zone of India. Let me illustrate this with an example from a district in the Deccan Plateau. We found that out of the total 750,000 hectares of land in the district nearly 650,000 hectares are being forward. The district today looks like a desert and its crop yields are abysmally low. No one knows what the multitude of public works programmes in the district add up to—ecological enrichment or steady ecological destruction? No one knows how much tree or grass cover is needed to support agriculture in the area. Should that area be engaged in agriculture to this extent, or in growing grasses and animal care, or in forestry, or an appropriate mixture of all the three, so that we can not only get higher biomass yields from this area but also on a sustainable basis? Only once the *ecovision* for an area is clear, can plans be formulated to turn the vision into a reality. We need to develop an idea of such *'sustainable economic futures'* for every agroecological zone of India. Planning must begin from the bottom and there must be perspective plans based on principles of sustainable and equitable development for every ecological region.

### Environmental Agenda 3

### *Employment guarantee built around programmes for ecological regeneration*

Unemployment is a major problem in this country. Fortunately, ecological regeneration is a very labour intensive exercise, whether it be soil or water conservation programmes, digging ponds and tanks, or afforestation. Once a decentralised eco-development plan is available for a particular ecological region, massive employment can be created through activities aimed at the restoration of the ecological infrastructure. If we can somehow tie together a legal employment guarantee with programmes of ecological regeneration I think we can make a massive bid to meet people's needs on a sustainable basis.

To do this we can learn a lot from the Employment Guarantee Scheme of Maharashtra, the only state which guarantees a job as a matter of legal right. A lot of employment creation under this scheme has been in making roads but there is now growing interest in creating jobs in afforestation, building of percolation tanks and village ponds, etc. There are many problems with this scheme but still I think other states can learn a lot from it. Today millions are employed in drought relief projects, most of which are adhoc in nature. Drought relief projects should provide more than relief *during* drought. They should provide relief *from* drought.

### Environmental Agenda 4

### *Rural development must become equitous and holistic enrichment of village ecosystems*

This fourth item on my agenda sounds very technical but essentially it just paraphrases what Gandhiji once said, that our villages must become self reliant in their needs. They could at least try to become self-reliant in their diverse biomass needs first—in food, fodder, fuel, biomass-based building materials, artisanal raw materials, etc.

Every village in India is what scientists technically call an integrated 'agrosylvopastoral entity', that is, every village has not just agricultural fields but also grazing lands and forests, groves and trees. All these three systems interact with the water system in the village to create a highly complex system to support life in our villages. Our objective should be to develop the productivity of all the three major land systems and not destroy the productivity of one at the expense of the other. Holistic enrichment of a village ecosystem means that we plan for all the private and common (including government) lands in the village in such a way that ecological security is maintained and all the diverse fuel, food, fodder and other basic biomass needs of the people are met on a priority basis. Today rural development has mainly come to mean what can a peasant do to plant on private lands to earn more money by selling in the towns.

On the contrary, any biomass production in a village ought to observe the following order of priority :

1. Planting for Ecological Security
2. Planting for Basic Survival Needs
3. Planting for Income Generation and Export

Today the order of priorities is completely reversed. Farmers plant trees or crops just for export and then for basic needs and never for ecological security.

How the holistic enrichment of a village ecosystem can be achieved is illustrated by the village of Sukhomajri situated in the Sivalik hills near Chandigarh. Ten years ago the area around Sukhomajri was highly degraded and the mud carried by the stream from here would silt up the Sukhna lake in Chandigarh and in one downpour farmers would lose half their fields. P.R. Mishra, a soil conservationist, tried to convince the villagers that they should not graze their animals in the watershed area but they argued back, "where will our animals go?"

Mishra finally realised that farmers will do something only when they will benefit from it. The most important thing that anyone can get from a watershed is water and every farmer is hungry for water. So Mishra built a small earthen dam. The first monsoon came and water collected behind it. Then there came a break in the monsoon and the rainfed crops of Sukhomajri began to die. The villagers came running to the soil conservationist for

water. He said, "you will get the water and but you will have to stop grazing your animals in the catchment area." The villagers agreed. Since then, crop production in the village has gone up from three quintals a year to some 17 quintals a year, and now instead of one risky crop, the farmers take three assured crops because of the availability of irrigation. From a food importing village, Sukhomajri is now a food exporting village.

But to his dismay, the soil conservationist found that some villagers were still taking their animals into the watershed. These people turned out to be landless people and they said that they had not benefitted at all from the water from the dam. They were, in fact, pointing out to a grave failure of our entire water management system, that is, water distribution has simply followed the inequities in land distribution. So, in this project, it was decided for the first time in India that all houses, landed or landless, would get an equal amount of water. Those who do not have land either sell the water to those who have land or enter into a sharecropping arrangement. That is, they can say to a fellow villager, take my water and I will take, say, a third of your crop. But simply because they are landless does not mean that they do not have the right to water, a common resource.

Now everyone in the village protects the watershed and trees and grasses are coming up well by themselves. This has increased the availability of fodder greatly and Sukhomajri now sells some Rs. 3 lakhs worth of milk every year and most people have got rid of their goats and now own fat, high-yielding buffaloes.

With the coming of trees, the fuel problem for the women has eased. Simultaneously, the villagers are planting *bhabhar* grass in the watershed. This grass is good for making ropes and *baan* for *charpoys* or it can be sold off to paper mills. Sukhomajri is now too rich to get involved in rope making but in a nearby village Nada, several Harijan families now earn Rs. 400 to 500 a month making ropes from the bhabhar that they can get right from the backyard of the village.

Thus, in this village, improvement of the village ecosystem has greatly increased food production, improved animal care and milk production, reduced fuel problems, and revived artisanal crafts. Environmental improvement has changed the economic future of Sukhomajri in a dramatically short period—just six years. This is what we need to do in every village of India. Environmental improvement is not a brake on economic development.

A holistic and equitous enrichment of village ecosystems as in Sukhomajri, will demand in particular two things:

(a) A new approach to water management; and,
(b) Massive planting of trees on common lands.

### Environmental Agenda 4A

#### *A new approach to water management*

To improve and enrich village ecosystems we will have to stress a new approach to water management. We must move away from the civil engineers' stress on big dams and canals to a multidisciplinary understanding of hydrology, ecology and political economy. The fundamental principle of water management should be to hold every drop of rain where it falls. If it falls on a slope, there should be trees on it. If it falls in fields, there should be terracing or contour bunding. If it falls in a nala, there should be a nala bund. If it falls in a village, there should be a village pond or tank or a series of tanks. Even till today India uses only 10 per cent of all the rain that falls on the land. At the moment there is too much stress on big systems rather than small water harvesting systems.

In Ralegaon Shindi, a village in Ahmednagar district in Maharashtra, Annasaheb Hazare has got his fellow villagers to build 17 nala bands and percolation tanks. Even at the height of the drought in 1986, we saw cultivation going on here.

Similarly in Jalna district, in a village called Dev Pimpalgaon we found that a voluntary agency had built several nala bunds. In front of one of these bunds was one of the few wells that was still yielding water while the rest of the district was getting water on bullock carts. We need to create such small harvesting systems on a massive scale. The second fundamental principle must be equity. Water is a scarce commodity and will become scarce with time. It must be used with maximum efficiency for the maximum public good. Sugarcane, for instance, a crop which uses water intensively, cannot be permitted in semi-arid areas.

### Environmental Agenda 4B

#### *Massive planting of trees and grasses on common lands*

India has about 100 million hectares of common lands: panchayats lands, revenue lands and government forest lands. Most of these lands are in a highly degraded state.

The maximum environmental destruction today is of common lands, that is, lands that do not belong to anyone individually but are owned by panchayats, government revenue departments or forest departments. Nobody cares for such lands. Centuries ago, before the British came, there was great consciousness about the care of common lands but British policies destroyed all that.

In the Aravalis, we came across a wall in the centre of the hill. Above the wall, the hill was totally barren but below it, there was some grass. The difference was that above the wall was government revenue land and below it was private land.

Multipurpose trees which can hold the soil and water and yield fuel, fodder and food, should be planted on these lands. Not eucalyptus, pine or teak, which are planted for the sole purpose of making money by meeting urban-industrial demands.

But multipurpose trees are browsable and like the fields of wheat and rice, must be protected. The grazing pressure in India is intense. With only one-fortieth of the world's land area, India supports over half the world's buffaloes and a seventh of its cattle and goats.

But while people do protect their crops, why don't they protect trees and grasses? With the nationalisation of the forests and the erosion of their customary rights, people have become alienated from their commons. Foresters don't realise that forests are not just 'natural entities' but also 'soil entities'.

If multipurpose indigenous trees are to grow again on the commons, social and political conditions must be created so that people can again develop a special relationship with these trees.

The question today is how do we once again create a relationship of the people to these lands so that people will care for them. There are two ways this special relationship can be created:

a. by further privatising the commons (through tree pattas or leasing out large tracts to private industries) ; or
b. by ecologically enriching them while retaining them as commons for the common good.

On Gossava island in the Sunderbans, some 100-200 trees along the roadsides have been allotted to a specific landless family which now takes care of these trees. These roadside plantations are doing well.

In Udaipur, Rajasthan, there is a scheme to identify the poorest tribal families and give them two hectares of barren forest land every year if they plant trees on them and take care of these trees. The trees are coming up well and the tribals have benefitted greatly by just sellling the grass. Later when the trees come up they will benfit from the trees too

The problem with the first approach is that it will generally lead to unipurpose trees and monocultures. And as commons constitute the survival base of the poor, this will put into greater hardship those landless, small and marginal farmers, who will now have to subsist on still smaller commons. Also what happens as population grows?

Instead of privatising commons into small parcels of land and handing them over to individual families, an even better approach is to get whole communities organised to plant and protect trees together on common lands. The second approach is very difficult and has been tried only in a very few places like :

a. in Chamoli district by Shri Chandi Prasad Bhatt of the Chipko Movement;

b. in Sukhomajri and Nada (near Chandigarh) by the Central Soil and Water Conservation Research and Training Institute; and,

c. in Ahmednagar by the Society for Comprehensive Rural Health Projects.

Their results are indeed outstanding. Bhatt organises eco-development camps in which people, and especially women come from all over to discuss their daily problems. They take up tree planting in a big way. Their survival rates are well over 90 per cent while the forest department cannot achieve even half that.

The women plant the trees as a community effort and share every benefit equally. The grass starts growing fast and in their native wisdom these women have devised a very simple and equitable distribution system. Once a month, the head of the Mahila Dal of the village announces a particular day when one person from one household can take as much grass as he or she can. Because afforestation is often done on panchayat lands, we have invariably found that the sarpanch creates difficulties. He either wants to benefit more than the others or he wants to break up the group as he feels politically threatened. Thus, if afforestation has to take place on common lands with people's participation as in the Chipko Movement, all those politicians will have to be dealt with who prevent the poor from organising themselves.

Invariably it is the following three principles that make up the success of community afforestation efforts on common lands :

a. *Control* of the interested community over the piece of commons to be ecologically enriched ;

b. *Unity* within the community (or if the community is stratified because of village politics, within the group that takes up the ecological enrichment) because protection of nature has to be a function of all and not just a few; and,

c. *Equity* in the sharing of the produce from the commons, without which unity is not possible.

This is a job which cannot be done by bureaucracies alone. The role of the political system in bringing about such social organisation is paramount.

### Environmental Agenda 5

#### *Resource-rational urbanisation*

By the end of the century India will have the world's largest urban population—well over 300 million people. Between now and the year 2000 we will add more urban Indians than rural Indians.

Current patterns of urban development are based on imported models from Europe and North America and they use systems that are highly capital-intensive and natural resource-intensive.

Capital-intensity divides the urban population into the urban rich (who can afford the fruits of science and technology) and the urban poor (who have to make do with a bare existence).

The resource-intensity ensures that as cities grow the rural hinterland from which the resources are extracted, are either environmentally destroyed or transformed. For example, the original forests are first destroyed and if regenerated at all, then by eucalyptus, pine or teak, leaving the rural people without their survival base, forcing them to become ecological refugees.

Managing the world's largest urban population will pose immense challenges and the answer lies in technology choices built around the principles of equity and resource-rationality. For instance, can we think of improved mud buildings with an excellent telephone system; transport systems dependent on a conjunctive use of bicycles and modern buses; composting toilets with a fleet of vacuum suction trucks, etc.?

It is imperative that we urgently find an equitable and environmentally-sound process of urbanisation. To do this we will have to make more appropriate choices of technology for our towns and cities. Let us take, for example, the housing situation which is becoming worse in most Indian cities. Now the only type of houses we want to build are brick and cement houses. On one hand, brick and cement are expensive materials and even a large number of urban dwellers cannot afford brick and cement housing. And the low-cost housing that our urban development authorities build are both climatically bad and psychologically demeaning. At the same time, both brick and cement are produced in a way that is extremely environmentally destructive. Why can't we think of mud buildings which will be more environmentally sound, equitous and climatically better. Surely, our scientific knowledge can be used to upgrade mud buildings. We have beautiful mud buildings all over India. But it is really a question of social values.

Let us also take a look at water supply, which is becoming a major problem in all our cities. Jodhpur gets only a few inches of rainfall. But whenever the rain falls here, it leads to a flood. This one flood in a year would earlier be caught by a wide network of canals and collected in tanks and ponds all over the city. This is how the desert city of Jodhpur survived for centuries. But instead of preserving this system, modern Jodhpur is destroying it. Waste is now dumped into the canals and tanks like Fateh-sagar have nothing but green slime and stink. And, simultaneously, the entire catchment area for these tanks in Jodhpur is being ecologically devastated with extensive quarrying, totally disrupting the water flows. Today Jodhpur is not a self-reliant city in as vital a resource as water. It depends on a big dam some 100 km away and a long canal to feed it. Urban planning must take into account the health of the environment which sustains the towns and city dwellers with natural resources for their survival.

### Environmental Agenda 6

#### *Conservation-oriented education*

Ultimately, education is very important. We must make our people environmentally conscious. Educated, urban individuals are today so alienated from their environment that they have become, what is called, 'resource illiterate'. But as powerful and heavy consumers of natural resources they can do enormous environmental harm and deprive the poor of their own environmental needs. The poor, too, want to adopt the consumption patterns of the town dwellers. Conservation-oriented education is a need of the day. But environment must not be just taught as a separate subject. Its lessons must be internalised into the teaching of all other subjects, from history and geography to engineering and medicine.

Most important of all, modern Indians must be taught to appreciate and imbibe the traditional and cultural practices that were prevalent for conservation. These practices were often built around religious precepts. The challenge lies not in decrying these practices as superstition but in maintaining them while lifting them on to a secular plane.

In fact, I have found that there is no subject which can make an Indian feel more of an Indian than by learning about the environment. As I myself began to get interested in environmental issues, I first began to learn about my country's lands, hills and mountains, rivers, and deserts. And as I began to learn of this country's extraordinarily diverse natural systems, I began to know more about the people of this country—it tribals, its nomads, its fisherfolk, its women and so on, and how they survive within their environment. And finally I began to learn of the country's diverse cultures. Today, I can say, I have far greater pride in this country and its people than I have ever had before. And, thanks, almost entirely to the subject of environment which has taken me on to a new discovery of India.

But, most important of all, what I have learnt is that even 200 to 300 years ago, well before there was any population explosion or development explosion, people in this country were conservation oriented.

Take the case of the Bishnois in Rajasthan. The story goes that some 200 years ago, over 350 Bishnois died protecting Khejari trees from being cut by the kings' men. Today this place is an important pilgrimage spot for environmentalists.

Till this day Khejari is never cut in Rajasthan even when it grows in the fields. If we want to see old trees—200-300 years old trees—we can find them in the Chotanagpur plateau only in the sacred groves, the *Sarnas*, of the local tribals.

If we want to see the rich, lush original forests of Meghalaya, we can now find them only in small patches and all those are sacred groves. Otherwise all the original forests have disappeared.

Even our myths are full of ecological messages. Many of us know of the story of King Bhagirath and his prayer to Goddess Ganga to descend upon the earth. But Ganga told him that unless there was someone to tie her up she would destroy the world with her fury. So Bhagirath then prayed to God Shiva. Now Ganga descends into the hair locks of Shiva and comes out as a trickle to sustain the millions living in the Indo-Gangetic plains.

Let us interpret this myth in another way. Shiva is all over the Himalayas and, therefore, his hair locks can be considered to be the forests of the Himalaya. The Ganga descends every year as the monsoon and the forests of the Himalaya tie her down and she emerges as a trickle to become a mighty river. Now that we are cutting down the hair locks of Shiva—the forests of the Himalaya—the Ganga must become the fury, as the myth always said—more floods on one hand and more drought on the other.

### Environmental Agenda 7

#### *A national rehabilitation policy*

If dams must be built and if industries and cities must expand, we must develop a national rehabilitation policy soon. More and more people are being displaced by cities, by industries, by mines and, especially, by large dams. This proposed policy must make displacement and resettlement exercises honest and open; respectful of people's economic and cultural needs and their demand of land for land. Development must not be allowed to become a cause of impoverishment for anyone.

The worst affected by such displacement are tribal people who are heavily dependent on their lands and forests for their survival. The tribals near Ranchi have been opposing the Koel-Karo dams for nearly 20 years now. They are very poor people and when we asked them why don't they leave, they said what will they do with the compensation money. The money will disappear soon. They said "Our land may be small but it is our anchor. We also have some ber, mahua and jackfruit trees. We can somehow eke out an existence." The women in particular were most vehement: "We don't want money."

Because of this heavy desire of the people to stay wedded to their land and forests, it is vital that we develop a national rehabilitation policy as soon as possible.

These are but some of the action points that environmentalists are talking about and I am sure many more can be added.

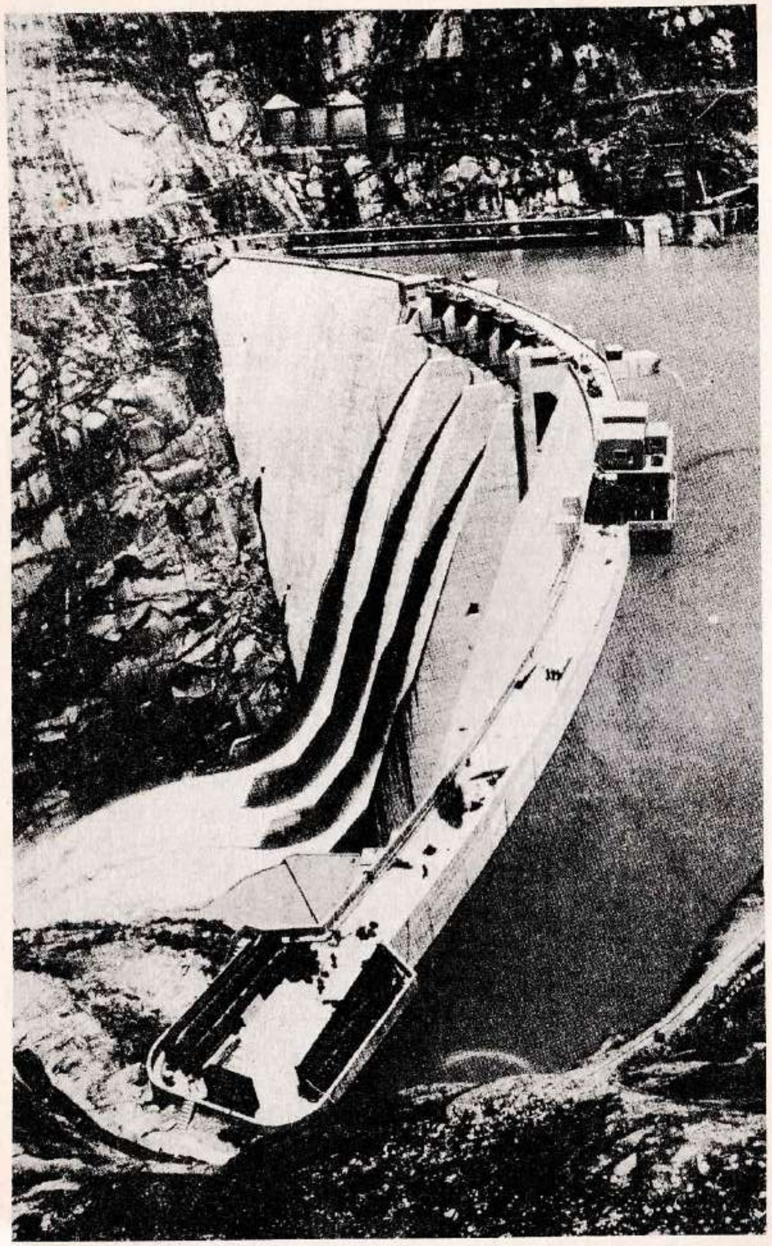
Acting to protect the environment is the duty of every Indian today. In the end, I can do nothing better than quote from the Statement of Shared Concern signed by leading environmentalists of India, which says :

> "The state of the environment and the human condition are closely related to each other. Environmental degradation and social injustice are two sides of the same coin".

This is because every ecological space in the natural environment is occupied by some human group or the other for its subsistence. Therefore, if the environment gets destroyed it will inevitably mean that someone is being harmed. Concern for the environment in a country like ours is nothing but concern for the people.

The last word must go to Gandhiji, who understood the essence of the environmental ethic long before any of us did, when he said:

> "There is enough in this world for everybody's need but not for everybody's greed".



# Ecuador: Gathering support for sustainable development

YOLANDA KAKABADSE

Ecuador is a small country of 2,70,000 sq km with a rapidly growing population that has now reached 8 million and subject to the same environmental problems that affect several other countries of Latin America. It has a strong tendency to unmercifully exploit natural resources for economic purposes, little awareness about the negative effects of this exploitation, and little attention paid to the need for seeking a balance between environment and development. Public participation in the solution of these and other problems is still weak.

The problem with the population is basically that 60 per cent of it is of mixed blood. It is a problem because not many people are happy with this situation. The Indians would like to belong to a mixed race; the mixed race would like to be white. We all know how in the colonial times, the caste you belonged to and the colour of your skin defined lots of things.

Ecuador's problems are deforestation, soil erosion, contamination by industry, by pesticides, water and air pollution and a high population growth. Once again, one of the big dilemmas is not that we have problems but that we have not been aware of them. Ecuador has been so rich that only in the last few years have people realised that something is going wrong, only when the lands are getting eroded and when people do not have food. We were used to a wonderful life: lots of fruit, wonderful rivers, landscape, mountains, grasslands and animals. When things started to go bad, nobody was prepared to fight against it; no-

**Paute dam, Ecuador.** FUNDACION NATURA body knew what to do and nobody was much aware about it. I am going to tell you three or four stories of what went wrong, some of the things we have done and some of the good things that have happened in the last few years.

Among developing countries, environmental objectives have often been depicted as opposed to development oriented goals. This apparent contradiction has created an unfavourable climate to the inclusion of environmental issues in public and corporate concerns. Among developing countries, uneasy political and social situations have contributed to give these long-term preoccupations a second level of urgency and importance. This problem is felt not only by Ecuador but also by the other countries of the northern Andean region.

Nevertheless, environmental problems have received more attention during the last ten years. Alongwith the recognition of their importance, there have been efforts to identify and analyse the most suitable means needed to reconcile the social goals implied in developmental and environmental objectives such as environmental education, community participation, long-term planning and appropriate technology.

**Deforestation**

Soil degradation is definitely the largest environmental problem in Ecuador. The deforestation process started in the 16th century when precious wood species were cut down to be exported. This process continued in Ecuador until the 1960s. Natural resources were exported at low prices and final products were imported at high prices. As a result of this process, the Andean region is now highly eroded and few areas still retain the original vegetation.

During the last two decades, forestry has acquired great importance in environmental discussions in Latin America. This importance is being given because of the fast rate of deforestation in the region. Afforestation efforts have been slow and ineffective in reversing the rate of destruction. While most of the government-directed afforestation programmes tend to include corporate efforts, some of the non-governmental projects aim at active participation of local communities in affected areas. Efforts to afforest have been usually with exotic species like eucalyptus and pine which are most common and often the only species available in government and private nurseries.

Important watersheds have seriously deteriorated. Most of the fertile soil of the Andean slopes is being carried away by the rivers. This loss is the result of inappropriate agricultural practices, deforestation and a colonisation process, aggravated by high population growth (3.2 per cent per year). The effect of sedimentation in rivers is causing important problems for hydroelectric projects. One of them, the Paute Hydroelectric project, was built only a couple of years ago for an expected life of 50 years, but it is now predicted that it will have a productive life of only 15 years.

Native forests of the Amazon basin and coastal lands are still being exploited for a few enormous and very valuable trees. Thirty per cent of the wood is wasted in the process of exploitation and commercialisation of the final product. Empty land is generally used for cattle grazing or farming of some traditional products. Often, failure results, because the soil is unable to sustain such agricultural practices.

Legislation forces wood industries to replant twice as many trees as have been cut down. But this law does not apply to small colonies or individuals. So the large industries have financially supported the acquisition of heavy equipment by the local people, who cut the trees and have no obligations to replant. The industrialists recover their debt in timber — a very easy way to get away from afforestation.

The law forces colonies to cut down at least 50 per cent of the trees on their land before they can get the property title — probably to demonstrate that they are going to use the land; usually they do not, because once the trees have been cut down, it is useless. Other large areas are destined for monocultures such as oil palm. As most of the concessions are in the hands of multinationals and, therefore, said to be supporting the nation's weak economy, the government's conditions for ecological considerations are weak or nonexistent. A similar attitude is evident on the part of oil exploration companies which, having signed contracts with the government, will not programme environmental protection activities unless local regulations bind them to fulfill certain obligations.

Ecuador is an oil producer and at the moment five or six large companies are working in the Amazon basin where all the great forests are. The Fundacion Natura told them that they were working in a national park and they should not be doing so. Their response was that the government had not told them that, so until it did, they would not worry about operating in a national park. If the government does not let people know it is a national park, the reason is not that it does not care that this is a national park, but the whole idea of national parks is not something that grew and developed within the country. It is a foreign concept brought in by the developed countries. Someone came from the International Union for Conservation of Nature 15 or 20 years ago and made a study of the country and said "These 10 acres are going to be national parks." That is how it was done. Nobody really understood what a national park was for. Obviously, local people are afraid of the formation of a national park. They think that their lands are going to be taken away.

Research on flora and fauna species is slow and often untimely. Large areas have already been destroyed with no record of their original characteristics.

Last of all, small native communities are under permanent pressure caused by development and colonisation projects. These cultures have depended for centuries on a balanced environment but they are being unmercifully forced to retreat to smaller areas which do not meet their needs, or to adapt to new styles of life sacrificing their own cultural values.

### Pesticides

Another important issue related to soil degradation is the misuse and overuse of chemical products by small and large farmers. High-powered campaigns by importers and distributors of these products, addressed to ignorant or illiterate people, have resulted in dangerous levels of contamination of food, water and soils all over the country.

Safety equipment like gloves, masks and boots are too expensive for poor land workers. Importers and distributors of pesticides do not offer alternatives that will suit this population.

On the other hand, existing laws and regulations to control the whole process are not coherent with commerce and industrial laws. Scattered efforts on the part of a few government officials and NGOs are insufficient.

### Industrial pollution

Ecuador and other countries of the region have rapidly developed an industrialisation process supported by government's economic plans. Laws to prevent pollution have not been reinforced by regulations, and, therefore, air, water and soils are being polluted with little control by the authorities. Public awareness has led the general public to protest against these

actions through public and private agencies in charge of industrial development. Initial measures are being taken against the most contaminating industries. Unfortunately, these cases are still considered to be exceptions.

Not long ago, it was found that people in the villages were using a very strong pesticide called Endrin, to fish. They threw Endrin into the river and some people waited a few miles down and caught the fish that were floating dead!

### Environmental awareness

After Fundacion Natura started in 1979, we felt that things were getting bad and we decided to prepare an environmental profile of the country. After this study, we knew what was lacking most was environmental awareness, especially among decision-makers. We knew that both ends were important to educate — from decision-makers to children. We started with the top and we launched an educational project using the mass media. The first thing we did was to call a group of 40 very important journalists of Ecuador to a seminar. The 10-day seminar had well-prepared material of what was going on in the country and pointers on how to interpret information relating to natural resources, the percentage of soil lost and deforestation trends. The project was very successful. From that day, not one of those 40 journalists has stopped helping us, publishing in the newspapers, on TV and on radio.

This information put into an audio-visual format went to decision-makers beginning at the very top, from the President to all Congressmen, all decision-makers in politics and political parties, industrialists, secretaries of states, mayors of cities and governors. The material was very sophisticated in its preparation. The photographs were wonderful and presented in a startling way the good and the bad of what was going on in Ecuador, environmental issue by issue.

Imagine a minister with three projectors and screens and one thousand slides being flashed with wonderful music! Many got impressed and felt that the show was especially prepared for them and that they must be important in the whole business. People indeed started to believe so. I have heard Indian friends mention that environment should not become a fashion. At the very beginning, we wanted it to be a fashion in Ecuador. We wanted the people to talk about it and to believe that it was something like Acid Rain in the developed countries. There was a time, after a year of this process, when decision-makers were talking about environment at cocktail parties.

Apart from decision-makers, we reached the general public mainly through radio. Radio is the mass media in Ecuador. It is very popular in rural areas. We prepared three radio series and 150 different programmes. We did this by asking a Latin American school for radio producers located in Quito to allow us to give them a seminar on environmental issues. These 25 students produced 150 programmes after the seminar which were adapted to the lifestyles of people from Ecuador and Latin America. They produced the most wonderful soap operas you can imagine. They talked about a grandfather telling a child about a river, how it was beautiful in his time and how he used to fish, but the child cannot any more; there is a boy and his girl-friend is dying of some disease caused by a contaminated river, and so on. Some of them were terribly dramatic and funny but always very short and fun to listen to. We made a hundred copies of these programmes and distributed them at no cost to 100 radio stations. Some of these stations broadcast them two or three times a day with the news in the morning, mid-day and evening. People listened to these and in the last few years have begun to react to all these programmes. It was not any more just a matter of decision-makers talking but groups of people in urban and rural areas who began to press for solutions in their areas. We learnt also that TV is very important in urban areas, especially in relation to programmes dealing with industrial contamination.

We have tried in the last eight years not to deal with bad cases publicly (unless we had to), but with good ones. But the two or three bad cases that we had attended to were taken to court. All the news releases on these cases for three months daily, have caused industrialists to be afraid of being subjected to the same process. When we have a complaint come in to our office saying that industry over there is contaminating an area, we send someone to interview the manager of the factory. In about 24 hours we have the manager visiting our institution and swearing that in one week he would sort out the problem, and he usually does! In one week, he invests the money that he should have probably over 20 years ago. He takes measures or sends out an official list of the different steps he is going to take in the next month to solve the problem.

We have preferred to invite people to participate in the process, instead of being aggressive to them. Not only because that

is a cultural reaction in our society, but also because we feel that every Ecuadorian is guilty of what has happened. Very few people were aware that they had been doing that damage on purpose. I think that 99 per cent of the people did not do anything because of lack of information or due to ignorance but because things were easy and the government did not inform them or did not put any pressure on the industrialists or anybody else to respect the environment. When nobody puts any pressure on a company or individual, usually the easy way out is taken. I think we all were guilty of that and so we have tried not to make the environmental movement in our country something that people have to be afraid of but something where people can expect some collaboration. That happened also in relation to the government.

We know that the government, because of the financial situation of the country, was never going to put any money into environmental education, for example. What we did was to design a project on environmental education, looked for funds and went to the Minister of Education saying: "Look here are the funds, this is the project, will you sign it?" And obviously he did, he signed it and made it official. So we implement a project for the government, although that is obviously not going to fill the gap in environmental education within the official school system. We distributed a set of posters free to all public schools and at some cost to private schools with some teachers' guides.

All these programmes have been implemented not only by the people but by teachers' groups. We have invited one group to design the project for the first grade, another for the second, and another for the third. The posters are about soil, water, wildlife and other environmental issues. As many as 75,000 teachers in the country have participated in this process in the last three years, designing the whole environmental education curriculum of schools. Some of them drew the pictures and some criticised them and changed them. The same thing was done with other materials given to the teachers like audio-visuals for urban schools and printed material and radio programmes for rural schools.

## NGO participation

The government did not pay much attention to environmental issues until Fundacion Natura started working on them in 1979. The strategy of Fundacion Natura has been to openly offer its services not only to the general public but to the government itself. As the government did not have the budget or projects programmed to deal with these issues, it gladly accepted the actions proposed by this environmental NGO.

It is interesting to note that Ecuador — unlike other countries of the region — is the only one where a non-governmental group has been created to fill in a gap left by the government. The general practice of NGOs in the surrounding countries is to monitor demand and put pressure on governments. Open confrontation has been frequent and the results have not always been positive.

To start with, government and political leaders in Ecuador were not prepared to deal with these issues. Reactions, therefore, were often inappropriate or ineffective. On the other hand, the weak financial condition of the country did not allow leaders to assign important sums of money in the national budget to deal with environmental issues.

It is evident that environmental problems arise from a deeper level that is rooted in three specific fields:

- **Lack of awareness**: The large amount and variety of resources in Ecuador has led its people to believe that there is no limit to their exploitation. For centuries, government leaders and the people have used the country's natural resources causing no apparent damage to the environment. Concern about these issues has appeared only since the second part of this century.
- **Lack of adequate legislation**: Due to the pattern of exploitation mentioned above, legislation has developed to prevent damage to the resources and areas as they have appeared. Laws are often incongruent with one another, repetitive or lacking in other areas.
- **Lack of environmental policy**: The country has not yet adopted one as a guideline for development plans and actions.

Fundacion Natura is working on these three issues. Other NGOs are operating on specific issues such as population, health, food and agriculture, afforestation and urban and rural community development. The presence of all these groups has to some extent strengthened the capacity of the general public to speak up and call for immediate solutions.

Another interesting thing in the programmes that we are working on is to convince our people that we do not need experts from abroad. It has been a trend in the last century in our country, that for whatever we wanted to do, we needed an expert, be it someone from the World Bank or USAID. In the last eight years, we have been trying to convince our people that we are the experts on our environment — that man who has worked in that ministry or in that department or organisation knows much more than any other expert from the World Bank or those sort of institutions. Not that I do not like some of those foreign experts but very often they are responsible for the big mistakes we have made in our country. A national environmental profile was prepared by us in Ecuador. Maybe the document fails in many ways, but the people read it because it was written by a list of people they recognised and they felt that someone from home has the experience and interest to solve problems.

Very often we have to look for funds from abroad, usually the USA, with conditions on those funds. We have to learn not to accept them just because they are a solution to a project. These institutions — may be because they are hearing it for the first time in our country — are ready to accept our condition: "No experts please, and let us decide how we want to do it, even whether we want to change it half-way because we decide it is not working." They should not be inflexible on all proposals.

Another thing that we have managed to do is to get our organisation funded locally. We look for foreign aid when there is no chance of funds within the country. Fundacion Natura itself and most small projects are funded by local enterprise and by members of the organisation. That gives us a sense of security, because otherwise, if we do not get foreign funds for a project, we are going to disappear! This way, we are absolutely sure that we will not disappear whether we get these foreign funds or not. We do not work directly at the grassroots but we support grassroot level communities and people, especially on afforestation. We try to promote groups and initiate afforestation and then leave them on their own to continue. This has not been a long process in Ecuador — it is just starting. Let me recount one experience in reforestation. A group of people lived in a highland community with very terrible socio-economic conditions. Women had an average of 18 pregnancies in their lifetime, out of which only five children were born and two survived. We found funds for afforestation at their request, which is another of our policies. We do not go to a community and propose a project. The condition of the project was that we look for funds for trees to be planted on communal land and for fences to protect the afforested areas from animals. If they wanted to plant trees on their private land, they had to pay a cost. This condition was placed on the community by itself. The leaders were selected by the community and decided that all the trees were going to be planted on communal land.

In the last three years, they planted 2.5 m trees and 90 per cent of the ones planted this year were bought by the community. These people are often really starving and they have other very important needs. Yet they are ready to spend money on trees. These people do not talk very much; refuse to really. But there is something in the whole process that is being instilled in this community — about spending their own money on afforestation. Most of the houses already have a small cluster of trees around, about 10 feet high. Other communities are getting interested in following the same pattern and are coming to us and asking us for support to initiate such a programme. After eight years of work, things have changed in a way.

The owner of a farm near Quito where I live has given us 800 acres of farm land at the top of a mountain crater for an environmental education programme. It is only 30 minutes away from Quito. We have an average of 500 students visiting the area per week, which is wonderful. A commission on ecology has been created in the Congress. An official education process has been initiated by the government. All 75,000 teachers in the country are participating in it. A factory was closed down for the first time in Ecuador with a judicial agreement because it was contaminating the urban area where it was situated. When students finish school in Ecuador at 18, they are forced to write a thesis, a paper on a subject recommended by the teacher. In the last two years, we have managed to get the government to agree that instead of writing this paper, they could do a series of afforestation programmes. So on weekends, students afforest the areas near their schools and communities.

About a year ago, I had a very peculiar telephone call. It was a very soft voice on the other line, which said: "I can't tell you anything now, can I call you in half an hour?" Half an hour later, I got this call from a lady in the Ministry of Forestry, and she was equally mysterious about the whole thing. In the end I found out that an Arab country was trying to buy large amounts of charcoal from the government and they had been refused in one Central American country and another South American country but our country was saying 'yes.' And that afternoon the minister was

going to sign the official agreement. It was to state this that the lady was calling. We managed to get through to the President in time and stop it.

It is one case among many that are going on nearly every week in Ecuador. I think it clearly lets us know that in some ways, we can hope for something better, even though things look bad. At least other people are doing something and it is not so depressing. Evidence of increased awareness on environmental issues can be observed through several governmental actions in the last few years. Last year a government institution was created to control environmental impact of natural resources exploitation. Fundacion Natura was requested to provide training and define the goals and objectives of this new department. The results have been good, and even though this department is only in charge of non-renewable resources, there is a general tendency to implement similar programmes within other ministries related to natural resource exploitation, industrial development and agricultural programmes. Several agencies for local or regional development are already implementing programmes that try to recover highly eroded areas, badly contaminated rivers or to implement programmes that might reduce the environmental impact of development projects.

In February 1987, the first Ecuadorian Congress on the Environment will be held. This event organised by Fundacion Natura, has the support and participation of all public and private groups and institutions interested in these issues. Ecuador and other countries of the Andean Region are in different degrees working towards the solution of their environmental problems. Nevertheless, as in many other Third World countries, international pressures or irrational exploitation of local natural resources frequently does not offer Ecuador another way to meet economic needs. Foreign debt, technological dependence, imported patterns of development and the demand of the developed countries to fulfil our financial obligations have led our countries to believe that exploitation of natural resources is not a matter of alternative but of survival. But the most important thing is that day by day, Ecuadorians are insisting on more and more participation and asking the government to find solutions to present problems and to prevent future ones.

**Ui**: In my experience, the fight against the multinationals which have no presence in the country, is more difficult than against domestic capital. Multinationals are floating somewhere and to find a person or group responsible for them is quite difficult. There are big differences between domestic capital and multinationals in Latin America. I observed in Brazil that there was no domestic capital at all, everything was multinational. Is this the case in Ecuador too?

**Kakabadse**: It is the case. Most multinationals do not have to take care to seek refuge behind local names and to present a local image. They make the plea that these enterprises should be supported because they bring development to the country. When multinationals feel aggrieved, they complain about our being parochial. It is definitely more difficult to fight them than national enterprises. National enterprises feel guilty. They know they have been affecting the people around them and the future of their lives and their children. Multinationals do not care about the future of the country. They have no guilty conscience with which you can play.

**Ui**: In India, is there any difference between the attitude of domestic and multinational capital?

**Agarwal**: I do not think the Union Carbide of India Ltd. acted very differently from Union Carbide Corporation after the Bhopal disaster.

**D'Monte**: Often the two are intertwined. The Birlas, who are responsible for one of the worst cases of pollution in India — the case of the Zuari Agro Chemical plant in Goa — have several foreign collaborations.

# Environmental action in Argentina: Social and spiritual dimensions

MIGUEL GRINBERG

Most of our problems in the South are alike. For us, environment is a matter of caring and sharing. Environment is not something that is outside there. We are the environment and since there are many approaches to problems, we should have a proper understanding that all these problems did not start this morning and are not going to be solved tonight.

In Argentina the environmental movement is a brand new thing. It was not possible to launch such a movement in the past. Environmental NGOs are totally a 1980s phenomenon in Argentina. Decades of military dictatorships, 50 years of a political Dark Age, and little awareness among the people produced a total lack of commitment in the ecological field. Since the nuclear programme was then completely run by the military, as a branch of the central government, most of the citizens' action was underground, mainly through postal communications.

Argentina is centralised in Buenos Aires, the federal capital, where the executive power (the President and ministries) sits with the Congress and all other administrative branches. The provinces exist in a very dependent way, since all taxes are collected by the central administration, which later on delivers funds to the provincial governments through a system called 'co-participation.' Very often the bureaucracy delays these contributions, and the salaries of provincial public servants are delayed, creating tense situations. Buenos Aires has been called 'Goliath's Head' by a great writer of Argentina, Ezequiel Martinez Estrada.

A democratic civilian government started at the end of 1983 after free elections took place as a development of the tragic Malvinas (Falkland) war. Many environmental NGOs and grassroots groups have since grown across the country. Several networks have been formed in the provinces of Cordoba, Santa Fe and Buenos Aires. In September 1986, the National Network on Environmental Emergencies was born, linking 60 groups from all over the country, many high school students from the provinces, and including for the first time Neighbourhood Associations formed as self-defence against industrial pollution in several suburban areas of Buenos Aires and the Mendoza province.

Right now, we must be very careful when we confront the democratic government with environmental problems, lest we help, without knowing it, the old regime in its effort to come back.

The people of Argentina want to recover the time that they lost in the last 50 years and the country is getting much involved in all the dirty works, from big dams to nuclear power plants. Let me give you an example. There is a forgotten little village in the southern part of Argentina known as Patagonia, a forgotten land composed of three provinces, plus some adjacent territories that include some 'disputed' islands in the southern Atlantic. This village has 300 inhabitants. Its name is Gastre in the province of Chubut. Recently, the head of the National Atomic Energy Commission announced that a repository of nuclear wastes was going to be built close to this little village. Environmental groups around the country started organising campaigns against the building of this repository, but the people of the village did not protest. They are all for the project because it is going to mean an investment of $500 million and it is their only chance to get something of the 'progress' in this world. They will soon have a couple of petrol stations, some asphalt roads, colour TV and probably Japanese motorcycles. For them, it is the only chance of getting involved in another reality. They believe that otherwise the whole region will suffer in the future. It has been forgotten for years and it is going to be forgotten for another 100 years.

Argentina has two nuclear plants in operation (Atucha I and Embalse), in the provinces of Buenos Aires and Cordoba, respectively. Atucha II is under construction, and a fourth one has been announced for construction in Hernandarias (Entre Rios province). Argentina has completed the 'nuclear cycle' with independent production of heavy water and enriched uranium.

The launching of a nuclear submarine has been promised to the people by the navy, while there is a strong belief that the nuclear bomb is among the military's secret plans.

Most environmental NGOs are asking for a nuclear moratory, a ban on further plans to construct nuclear plants. Several accidents have already produced fatalities within the nuclear industry. Recently, technicians from the inner circle of nuclear experts have denounced failures in the security systems of both nuclear plants. Radioactive elements have been stolen thrice this year from the National Commission on Atomic Energy. A very important heavy water leak caused the temporary closing of the Embalse Plant, and right now the Uranium processing plant at Los Gigantes (Cordoba province) has been closed by the local authorities because it has been poisoning the surrounding rivers and lakes that provide drinking water to Cordoba's capital city, the second in importance in Argentina.

The same situation prevails with dams. Big dams, hydroelectric plants and many new industrial investments (partly Japanese, partly Soviet Union, partly multinational such as Hoechst and Monsanto) have taken place without any study of the environmental impact. The province of Misiones is going ahead with the highly criticised Urugua-i hydro electric plant. But dams don't come alone. They bring factories that are going to use their electricity. It means work for the people that live in the surrounding areas. It is going to bring roads, cars, trucks — 'Progress'. Generally people that live close to these projects are very much in favour of them because never in the past has something happened to bring them the possibility of change. Argentina development programmes completely overlook the Environmental Impact Assessment (EIA) in its planning strategies. Some NGOs are trying to gain expertise in this field.

As far as desertification and erosion are concerned, no official reports are available, and no research has been done for decades in this field, but it is a growing concern among land specialists. The National Network on Environmental Emergencies is slowly gathering information from them. We hope to produce a report very soon. In the meantime, climatic changes and deforestation have caused great floods during the last five years in several places of the country. The governments of the provinces of Misiones and Formosa (they have the last pockets of sub-tropical woods) have announced a programme of cheap wooden houses, using Scandinavian technology.

Similarly, chemical pollution is growing. Every Saturday, both the leading Buenos Aires newspapers (Clarín and La Nación) print rural supplements. Their advertisements are basically a catalogue of every possible pesticide and herbicide, including some of those listed by the global Pesticide Action Network as the Dirty Dozen. Lindane, Heptachlor, Parathion and Aldrin go together with all sorts of hybrid seeds, while the largely agricultural country of Argentina looks for a Green Revolution, trying to export grains and earn foreign currency to pay the huge foreign debt (US $50 billion). These pesticides are also sold freely for home use as insecticides all across the country.

The country is involved in a strong industrial push siting all sorts of plants in heavily populated suburban areas. Some 60 km from the city of Buenos Aires, there is an important city named La Plata, and close to it the highly populated sector of Ensenada-Berisso, with port activity. It is the most polluted site of Argentina, similar to the one that shames the city of Sao Paulo (Brazil), the infamous Cubatao. The Ensenada-Berisso complex involves heavy petrochemical activity — Argentina is 90 per cent self-sufficient in petroleum — with 11 major companies sited here. The place is full of heavy industries and heavy poisons. All over Argentina lead poisoning is common.

National parks are being ravaged for commercial use of trees and by the construction of tourist centers looking again for foreign currency. Environment laws do exist, but no one enforces them. The Alimentary Code is not considered by the big industries. Rivers are constantly poisoned.

The problem with environmentalists all over is that they are prisoners of the problem that development creates. We repeat the ancient story of the conqueror and the conquered because that is the way things keep revolving in this world. Immediately after World War II, in the 1950s, many countries started claiming their independence. While Third World countries were gaining their independence, in the First World many technocrats started talking about interdependence, saying that nature is indivisible, that we are one earth, that this planet is our home and that we must cooperate in order to build together a common destiny. The concept of interdependence is now in every international viewpoint and for many environmentalists as well. It is a way of forging a compromise, but it can also be a way of doing nothing.

When we speak about development, it goes hand in hand

with environmental problems. Why development? What development? Whose development? Those are the questions of the so-called alternatives. What we ought to put in place of things we are rejecting, is a question that has not been answered yet.

For us, the question of caring and sharing has a lot of spiritual meaning. I am surprised at the absence of something in the Indian environmental concern that we from South America always associate with India. India is the land of the Bhagavad Gita and we have plenty of Indian influence in the peace movement and the environmental movement in Buenos Aires. There is the Sai Baba Centre and the Brahmakumari University and they are all involved in the grassroots movement in the country, not only in Argentina but also in Brazil. In India, I expected to have a glimpse of those deep values that are all nursed in Mother Nature. For us, the spiritual dimension is very important. Most of the people link environmental work in Argentina with spiritual groups. It does not mean that everybody is in it but we treat it like a tribal movement; in fact, we are creating a new tribe. Sometimes we would meet in parks for group meditation. It may not seem so but it was a very provocative, radical act under a military government.

Most of our work is unfunded. It does not mean that NGOs do not get funds. In the last three years, several very important things have been achieved. In August 1984, for the first time on the Latin American continent, a small municipality in the South, El Bolson, got from the City Hall a reservation of its area as a nuclear-free zone. This was backed by the whole community, after much effort in creating awareness. Other municipalities in the area are trying to implement the same law. These municipalities are very important because the most important nuclear projects of the country are established in those provinces. It means that several areas cannot be earmarked for nuclear projects. This network blocks roads used for carrying nuclear wastes and impedes many branches of the nuclear industry, especially mining. It is an example of what a community can achieve, not through confrontation but education within the community.

The same thing has been going on in the courts. The pesticide 2,4,5,T was banned by a court after a group of citizens issued a law suit. This will apply for the whole country. It started as an apparently ineffective action by three young lawyers, plus a couple of environmentalists. This action has shown that mechanisms exist which were never used before by ordinary people. In recent years, confronting the police, organising of parades and signing of manifestoes, have been replaced by community work, and teaching and spreading ways of self-defence, which have proved more effective and stronger than many noisy means.

As the environmental movement has been developing, all these concerns of self sufficiency and self-determination have made us realise that it can be measured at three levels: the environmental level, the social level and the spiritual level. Dealing with the environment is an art because, as I said, we are the environment. I am a middle class intellectual. Earlier, I heard a comment about middle class people; we do not glorify the poor in my country because among the poor there are as many rotten people as in the higher classes. It may sound provocative and perhaps it is not going to be liked by people who are glorifying the poor, but it does not mean that we must treat the whole problem in terms of classes, because classes have also been an invention of the conquerors. The conquerors have innoculated our own souls to keep reinforcing divisions. That is the reason why we, and many others like us, behave like planetary citizens.

But the main question is what we put in place of what development is trying to sell us. In many of our communities, this has led us to behave as if we were the government. We are not promoting green parties for the elections, we are not trying to seize a municipality or a post in the Congress, but we are starting to operate our daily lives as if we were the government. This means that there are going to be a few things that probably are not spectacular but can prove a very important, contagious example of what some other people can do somewhere else — like a group that is working on appropriate technology, another group working on organic farming and so on. These are living examples of what common people can do for themselves without waiting for a government bureaucrat to take care of the problem.

Finally, the example of the CSE's State of India's Environment Report is something we are trying to implement right now. For the first time in our country, it is being done without funding. Whenever we meet, we all contribute our efforts. Everybody finds money for his or her ticket, and we do not stay in hotels, we stay in other people's houses and we gather in public parks when it is not raining and in covered places that are lent to us. Sometimes it is a union, sometimes a social club, sometimes a church, and we are slowly starting to prepare a state of our environment report.

The democratic government in Argentina is desperately looking for progress, dreaming of creating a big power in the region, with Brazil as the potential rival. The environmental struggle is just beginning.

**Kocherry**: You stress very much the spiritual dimension. What do you mean by spiritual? Some people say committed work is equated with spiritual activity.

**Grinberg**: In our countries in South America, the conqueror came together with the Catholic Church, so everything linked with the spirit is normally attributed to the Church. When I say spiritual, it is not related to worshipping idols or gods. We take the human experience as a whole. We are sensitive and transcedental beings with a divine centre. We are so dominated by the material values of western society that we are simply rescuing one concept — that we must feed our souls the same way that we feed our stomachs.

# Environmental dissent in conservative Japan

UI JUN

The most crucial factor in the anti-pollution campaigns in Japan has been the formation of *Jumin Undo* (citizens' movement) type grassroots organisations. These organisations will probably continue to shape social and political change. Japanese success with pollution control has been noted internationally, especially in Western Europe, but the true motivating force behind these changes has been the grassroots movement, shaping public opinion, and forcing administrative agencies to act. Due to the economic depression of the mid-1970s, these movements have also been exposed to difficulties, but there are now greater possibilities for political power emanating from them as they struggle with new issues related to the quality of life in its totality.

Inspite of favourable geographical conditions, such as being an island, why was Japan to become the most industrially polluted country in the world? The answer comes from a detailed analysis of modern history as seen in the processes of modernisation and industrialisation. There are many conditions that are different from those of Western European industrialisation.

## Attitudes of industry

Industrial capitalism in Japan was bred from the very beginning under a strong national policy of 'rich nation, strong army'. There has been no history of resistance and revolution against imperialistic powers or to the feudal system in the process of

**Air pollution in the early 1970's in Yokkaichi.** KYODO capital formation. Industrial capitalism in Japan has, therefore, had no chance to seriously consider the welfare of the people. There were few chances to argue for industrial social responsibility as separated from the national interest. Industrial capitalism in Japan has always pursued maximum profits protected by national power. Investment productivity was maximised by sparing even minimum pollution control such as dust collectors and wastewater treatment plants, which were common necessities abroad. This, alongwith low wages and trade protectionism, was one of the three factors leading to rapid economic growth.

The post-war modernisation of the steel industry saw the introduction of the LD converter without the dust collector, a total lack of wastewater treatment in the paper and pulp industry, and an electroplating industry which greatly supported the automobile and home appliance industries. These are typical examples of early negligence, leading to rapid expansion of these sectors. The attitude of industry toward pollution victims was quite arrogant. It would deny the existence of pollution damage, undervalue the damage done when there was no escaping the facts, blame the victims for the problems, and bribe and scare the victims' movements. These tactics were freely used by industry in the past.

It was quite common to deny cause and effect by mobilising industry-supported scientists. This attitude did not change even after World War II, inspite of the democratisation of Japanese society. More than 20 years of concerted public opinion were necessary to criticise such an attitude in the 1970s. Facing chronic depression, Japanese capitalism again started attempting to control workers in the extreme, stressing collectivism and international competitiveness, and by stressing national interest.

## Character of science and technology

From the very beginning of its industrial modernisation, Japan has introduced the newest Western technology and spent much effort in adapting it to local conditions. Pure science, being considered unproductive or harmful to ruling power systems, was carefully rejected. Many engineering technologies were examples of the former; social science was a typical example of the latter. Among engineering technologies, unproductive technologies such as sanitary engineering, had a lower priority, so its introduction was much delayed.

The most basic factor in Japanese science and technology has been the skirting of the stages of endogenous development with the newest forms of science, selectively introduced into Japan. The word 'science' in Japanese implies fragmented studies. Rational thinking and a spirit of scepticism were forgotten, with science and technology being considered tools for a 'rich nation, strong army'. The choice of science or engineering as a profession was motivated by a desire for an elitist position rather than out of humanistic orientations.

By the 1970s, environment departments in many national universities were almost all groupings of different sections of science and technology, all claiming relationships to the environment. There was little consideration of the synergistic, interdisciplinary character of the problem. Such limitless expansion of sectionalism in science, without the benefit of ethics, is perhaps one of the reasons why Japanese scientists lack originality.

Under these circumstances, there are only a minority of scientists who view industrial pollution as a larger social problem and, under great pressure from the government, are being discriminated against in funding. For example, the University of Tokyo, representing the highest of higher education in Japan, had until the 1970s and the Minamata disaster, only once spoken out naming the mine as the polluter—the Ashio Copper Mine case in 1890.

## Modern industry and industrial pollution

In the mid-19th century, Japan saw the colonisation of India and the colonial division of China by Western European imperialism. Warned by the situation, Japan decided to open the country and modernise, to become a late-starting imperial power. Western technology had already been introduced to some extent into Japanese mining before the Meiji era, and its effect was quite remarkable.

The foremost sector was the non-ferrous metal mining industry. This sector made use of the newest technology, even in the 1890s. Ashio Copper Mine was the most active mine. Gradually, the copper industry became one of the most important export industries. A large amount of mining waste was discharged into the Watarase river in the Ashio Valley, causing serious damage downstream, to fisheries and agriculture. From 1890 onwards, downstream farmers complained frequently to government and requested closure of the mine. But the government rejected the request.

In 1896, a large number of farmers tried to mass petition the government in a two-day march to Tokyo. The government nominated a committee of experts to prepare technical countermeasures for the pollution. But since the majority of the committee members were pro-industry experts, reflecting the increasing influence of industry in the national budget, the copper mine was not closed. Instead, technical pollution control methods were introduced.

The farmers tried various kinds of non-violent direct action. But, finally, the government succeeded in dividing them, using a flood control policy and public finance as tools.

The Ashio Copper Mine case ended in a complete defeat for the farmers' movement. Yet it was to prove a strong influence on future people's movements. After 1910, industries mushroomed in Japan creating various industrial pollution problems. Farmers' movements targetted these industries directly, avoiding the dubious protection of the government, and sometimes succeeded to some extent in forcing pollution control.

Between 1910 and 1930, during a relatively stable era when indigenous capital enjoyed prosperity, the Taisho Democracy made moves towards pollution control technology, perhaps to atone for the Ashio tragedy. It is important to note that these industrial pollution problems occurred in the early stages of Japan's industrialisation.

### Militarisation of Japan

In the 1930s, Japan went down the road of militarisation, so all protest against industrial pollution was regarded as anti-war and anti-national. The progress with pollution control in previous periods was forgotten and environmental destruction grew more intense. A typical example was the Kokusaku (National Policy) Pulp Company located along the upper reaches of the Ishikari River in Hokkaido; it was built in 1941 as a military factory for the production of tire cord for military use. The factory discharged, without any treatment, highly polluting sulphite pulp waste into the river, seriously damaging downstream farming, and completely destroying fisheries. World War II ended in defeat for Japanese militarism, and Japan was democratised by the occupation army in 1945.

Since the 1950s, Japanese industrial production began to recover, and pollution again showed its ugly head. In general, victims' movements were isolated and unsuccessful. The entire nation had to survive, and people were occupied with getting enough to eat, and there was no room for thinking about the suffering of others. Already in this period, many serious industrial pollution problems, which were to come out later as deep social problems, started to become visible; for example, the Itai-Itai disease of the early 1950s, the Morinaga arsenic milk poisoning case of 1955, the discovery of Minamata disease in 1956, the Honshu Seishi Edo River pollution case in 1958, Yokkaichi asthma in 1960, and so on.

These problems were mostly left untouched, being treated as strange unknown diseases, and even in the best cases, research funds for investigating causes were minimal. Permanent countermeasures were not considered seriously even where fisherfolk rioted as in the Edo river and Minamata cases.

The first successful anti-pollution movement initiated by local inhabitants was the Mishima-Numazu combine case of 1964, where after preparing a comprehensive environmental assessment study on their own, local people successfully blocked a government planned heavy chemical industrial complex. This had a strong impact on governmental policies relating to industrial siting. The government prepared the Fundamental Pollution Control Law to avoid any further action of this type on the part of local people, but industry resisted the implementation of any effective pollution controls and the result was an unenforceable law.

But with the second case, that of Minamata in Niigata, the victims' movement took it for granted that the government would not take effective measures, so they went to court themselves. This new action promoted similar actions on older Minamata disease cases, the Itai-Itai disease, and Yokkaichi asthma. Court actions provided forums for attracting public sympathy and exposing the sufferings of the local victims to the eyes of the entire nation. On the other hand these movements went out on the streets and gradually gathered public support between 1965 and 1970.

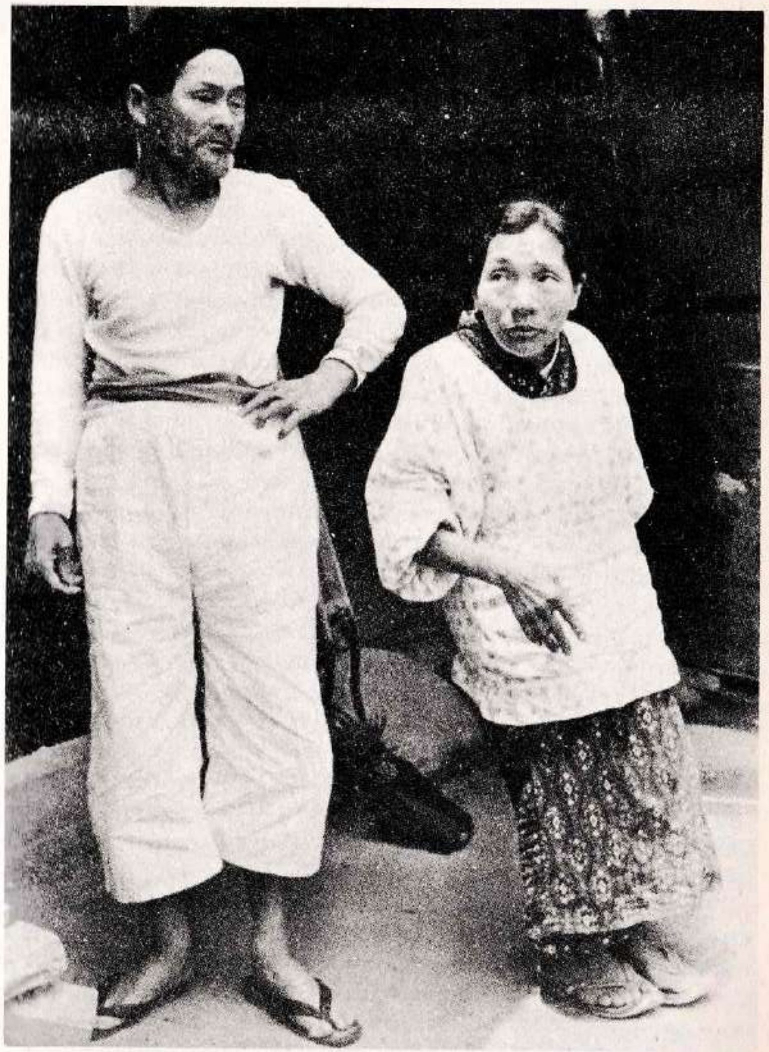
In 1970, news of automobile exhaust causing lead poisoning was followed by that of photochemical smog in Tokyo. Until then, industrial pollution was considered a local problem, limited to poor fisherfolk and farmers on the periphery of society. But now these same problems came to plague the middle class, at the centre of the nation. The mass media reacted explosively, and public opinion held to task the long term negligence of the government.

News of the Stockholm Conference came in 1972 and the Japanese movements proposed to send victims' delegations there to report on the Japanese situation. This proposal surprised the government, which had already sent a superficial national report to the UN Conference, and as a result it hurriedly prepared three additional volumes to describe the Japanese situation. This citizens' report entitled *Polluted Japan* prepared in English for the first time, contributed to a powerful reshaping of world opinion, as did the presence of the Minamata disease and Kanemi Yusho (PCB poisoning through rice oil contamination) victims.

This was the first effective international news of the dark side of Japan, the country regarded as a miracle of economic success. *Polluted Japan* was translated into Dutch, Danish and Thai, and in Thailand it was one of the triggers detonating the student revolution of 1973. In China, after the UN Conference, Prime Minister Chou En Lai heard the report on the Minamata disease from the Chinese delegation, and ordered an investigation into the problem in China; they discovered dozens of patients in the northeastern territory of the Sungaree river, showing light organic mercury poisoning syndromes. These were the direct results of the victims' mission to the UN conference.

During the first half of 1973, Japanese economic growth was at its peak, and all petrochemical complexes continued at maximum production, far exceeding capacity, causing a chain reaction of plant explosions everywhere. Widespread coastal mercury and PCB pollution was discovered nationwide, so that Japanese fishing was panic-stricken. Angry fisherfolk blockaded many industrial ports, and some complexes had to stop operations. The oil crisis that came immediately after dealt a strong blow to the Japanese economy. These events greatly harmed the domestic credibility of Japanese industry. Some proposed industrial sites were cancelled. The industry blamed local movements for the economic confusion. But the irony is that local resistance movements during 1970-73 to some extent had limited the size of Japanese industry and, thus, reduced the post-oil crisis excess capacity, resulting in stability. If there had been no such local capacity, resulting in stability. If there had been no such local resistance, the excess capacity would probably have been much larger, and the ensuing economic confusion much greater; so in a sense local resistance saved the Japanese economy.

But with the end of the high economic growth phase, industry increased its pressure on local movements. The proportion of public finance for harbours, airports and sewage construction, and semi-public finance for energy-related industries such as oil,



**An Itai-Itai disease patient, once the same height as her husband: cadmium poisoning.** KYODO coal, nuclear power and crude oil storage, greatly increased and with it the investments in the Japanese economy. The incidents of conflict between local people and these so-called national projects have also been increasing in recent years. The once-useful forum for open arguments, the courts, became quite conservative, generally supporting the government. After the mid-1970s, the social conditions conducive to local movements disintegrated. Even so, many movements still appear and disappear, exerting a certain degree of political pressure.

A new move in Japanese capitalism after the 1970s has been its internationalisation. It is remarkable how free-moving industrial capital has moved out of Japan and into the developing countries of Asia and Latin America, seeking low cost land, labour and less stringent environmental controls. The problem of pollution export is caused by the exodus of polluting industries into developing countries. Japanese dependency on trade has become so great even in agriculture, that the nation cannot generate even 40 per cent of the calories needed. This Japanese demand exerts powerful influence on the structure of agriculture and fisheries in surrounding countries, modifying them towards exports rather than national needs.

As a large industrial country, importing excessive amounts of raw materials and exporting innumerable industrial products, Japan is now a central example of the dependency theory, with relationships to peripheral Asian countries much the same as those between the United States and Latin America. The Japanese economy aids military expansion, works to support oppressive Asian regimes and produces innumerable conflicts which destroy the lifestyles of farmers and fisherfolk in traditional Asian societies. In a somewhat simplified pattern, the same problems seen in Japan in the 1950s between the cities and the countryside, are now being repeated between Japan and the developing nations of Asia. Sooner or later, Japan will have to respond to people's movements in Asia.

The specific character of the Japanese environmental movement derives from the fact that it started as a federation of lower middle class schoolteachers, local government workers, small shopowners, small landlords, with fisherfolk and farmers, those who are mostly outside the market economy. The central core is still the lower middle and poorest classes. This is different from the Western European movement which was started by upper middle class people, and from the American movement which has its origins in Europe, and, therefore, has had difficulty organising poor blacks and native Indians. In Asia, the movements are rather commonly lower class, as can be seen typically in the Consumers' Association of Penang in Malaysia and the KSSP in India.

## Minamata : test case

The largest pollution issue after World War II—Minamata—is still not solved, and the number of victims is still increasing. Since the discovery of the disease in 1956 and that of the second phase in 1965, the movement was limited to fisherfolk, who suffered directly through the contamination of fish. There was a clear difference of concern between the patients and the local fisherfolk's cooperatives not being able to sell fishery products, though the former were completely included in the latter. Little organisation support for the former came from the latter. In fact, fisherfolk tried to hide the fact of mercury contamination in many cases. Generally their movement was isolated, characterised by repeated petitions to the central administration and protests against the polluting industry, without knowing the social conditions surrounding the Minamata Disease; the movement was rather limited, and always vulnerable to government and industry manoeuverings.

In 1959, facing a serious crisis, the movement exploded for a while in a violent collision with the police; this earned it nationwide notoriety, but failed to provide a coalition with other mass movements. Later, the movement was defeated and isolated, with no measures left to resist the undermining efforts of the industry and the security police.

The second phase of the Minamata movement began with the 1968 visit of the Niigata victims to Minamata, which was the trigger for its revival and led to the 1973 court action victory, when nationwide support came for the victims. A citizens' movement to unconditionally support the victims was born in Minamata and then in Kumamoto, Tokyo, Kyoto, Osaka and so on. This was organised around individual membership, and took the form of networks between small local groups, independent of political parties.

Since the first Minamata court action in 1969, the support groups in Minamata and Kumamoto started research activity to prepare the evidence, even opposing the lawyers' group for the victims, as the lawyers tried to control the movement through professionalism. The citizens' group in 1975 prepared a most comprehensive report on the history of the Minamata Disease and the responsibility of the company. They tried to collect funds for the court action and other activities.

Among the activists was a half-blind poet and housewife, Ishimure Michiko; she described the glory and misery of Minamata fisherfolk and the lost paradise of the beautiful sea, with every delicacy of the Japanese language. Her works became bestsellers and classics as they very powerfully attracted the sympathy of the nation. Journalists living in Kumamoto city formed informal groups, cooperated in collecting information for the movement, going beyond the interests of commercial journalism. When a small group of Minamata victims started sit-ins in front of the main company office, to complain to management directly, hundreds of Tokyo citizens joined them, with tents and sleeping bags.

None of this independent activity was helped by existing organisations like trade unions or political parties. It is an undeniable fact that there was also the influence of student movements between 1968 and 1969. In this period, generally amorphous citizens' action surrounded the movement as a core and worked in a flexible way under requests from the latter, forcing the government and industry into some compromises. Meanwhile, the majority of Minamata citizens, probably Tokyo's as well, fearing a decrease in industrial activity, supported industry. So the victims' movement was always in the minority, and faced many difficulties, but these were mitigated by the nationwide support of individuals sympathetic to the victims. The period from 1973, when the first court action ended as a victory for the victims and until the present, can be called its third phase. On the issue of compensation for damage, the court proposed a kind of formula. But even the number of victims is not clear, with many hidden patients being gradually discovered year by year. The increase of Minamata victims exceeded the company's capacity for compensation. The government tried to limit the number of patients by tightly controlling official diagnosis of symptoms. The government also ordered the prefecture to issue special bonds to support the operation of the company in order to avoid bankruptcy.

The government's protectionist attitude caused many conflicts and legal actions. The citizens' movement entered into a protracted struggle to support the victims by providing them jobs other than fishing. A kind of agricultural cooperative was formed for the production and distribution of local products.

Meanwhile, the local supporters led by Ishimure Michiko called for an interdisciplinary study group of natural and social scientists, to study the drastic change of nature and society during the past century in Minamata, as a model of the modernisation processes seen in traditional societies. The study is still going on, but the first part was recently published. Several excellent films have been produced along with a comprehensive compilation of scientific articles on the Minamata Disease. There are various efforts to revive the memory of Minamata.

Perhaps the one single agency most responsible for the epidemic expansion of the Minamata Disease—the government—was not required to face up to its responsibility for negligence and protecting the industry inspite of many court actions. This is the point where the victims and citizens have not yet succeeded completely. The Minamata movement must, therefore, be evaluated as half success and half failure.

If there is any possibility of an ecological political group of the Western European variety in Japan, the most probable route would be through local elections, fielding many candidates with a coalition of movements working as support groups for such candidates. Where narrow collectivism is widespread, and reproduced in day to day formal education, the formation of a coalition of local movements will not be an easy task.

The grassroots movements must propose an alternative and a realistic political direction, even if small. The formation of such alternatives in a clearly visible way will show people that there is another key to success. Japanese movements must have an international focus and participate in a politics that is greatly interdependent and internationalised. A change in the wasteful Japanese lifestyle can significantly alter dependency/power relations within Asia. Surely more attention should be paid to the international relationships between grassroots movements in developing countries.

**Tom Stoel**: I felt it might be appropriate to say a few words on the situation in the US. Jun has given us a perspective from Japan and my group is probably the leading pollution fighter in the US. I would say that the things we heard today did not really surprise me. The US came into pollution control very recently and virtually all the pollution situations we heard today had their parallels in the US as recently as 1968. There is still terrible pollution from factories in certain parts of the US.

The Ohio river, which runs through the centre of Cleveland and Ohio, caught fire one year because it was so polluted. Many people in the US died from water and air pollution. The US is not as densely populated as India and the most polluting facilities have to be located away from cities but there is a parallel to virtually every situation here.

This is what Earth Day in the US represented about the environmental movement. It started the environmental movement—as distinguished from the conservation movement, the old 'Protect Nature' movement—in the US. The environmental movement had to do with pollution more than anything else. And it was not until 1970 that the US enacted a Clean Air Act and formed an Environmental Protection Agency. Before that, we had tiny units in our commerce department, of all places. In 1972, we enacted our first national water pollution legislation that had any clean up requirements. Before that, it was simply monitoring and I understand that it is the kind of law that you have now.

Since then the US has spent a tremendous amount of money on pollution control. I must say that we have managed to clean up a few problems; some of them have got worse like acid rain which was hardly heard of in 1970. Most of the rivers have been cleaned up a fair amount, as far as organic matter goes. But there is a very major problem in both air and water pollution by toxic substances, which are proving very hard even for the US to clean up. It is hard because we made the mistake in this early state of encouraging industries to discharge effluent into sewage treatment plants. These plants have great difficulty in dealing with toxics like heavy metals. We have to build pretreatment plants and all kinds of other facilities to deal with that problem at a cost of billions of dollars. Drinking water in many parts of the US is well known to have a percentage of cancer-causing substances. This is one of the major issues along with groundwater contamination right now.

But to the extent that we have had any success, I would mention a couple of things and one is that it does not seem to me that India is going to succeed in the long run by simply firefighting one plant after another. Let us just take the case of water pollution. India has probably got thousands of industrial facilities—virtually located on every one of its rivers. In the US, the breakthrough in the Water Pollution Act of 1972 was that the Environmental Protection Agency (EPA) could actually check the effort and industries were legally required to adhere to those standards, with permits and other ways.

Richard Sandbrook disagrees a little bit about enforcing national standards. But in some fashion, you have to take a legal standard and a time table for meeting that standard. And generally the standards are by industries or they can be according to the waterway they are located on. But if India does not have that, it will be a matter of negotiation with each individual plant and in the end, the river may not be clean. The different plants will do different things to the river, and it is an impossible problem.

Even in the US, there have been key industries that did not clean up and earlier, big ones like steel, chemicals, wood and paper got extensions under pollution laws. The deadlines were not met and they said, "We will go broke. We will not be able to compete with the Japanese if the government forces these pollution laws." Many of them have begun to come into compliance now and are doing what they were supposed to do ten years ago. Some of them still have not come into compliance, like our steel industry—it is almost bankrupt.

It is a long, hard road but I think India will have to start down on it in the right way and it may have standards that are different from those in the First World. It will have to agree what those standards are to be and start enforcing a part of them. One thing we did do fairly well in the US was that we did not want new plants being built without controls because once the plants are built, it will cost hundreds of millions of dollars to instal pollution control equipment.

Ui Jun was talking about the tiny costs of controlling the mercury which caused the Minamata Disease if it had been put in when the plant was installed. It is always cheaper to instal the equipment at the start than to come back ten years later and try to change a whole method of production. That is what happened in India's tanneries. It should probably never have used this process as far as I can tell.

Another matter is that the enforcement under India's pollution laws is very poor. It was mentioned that the fibre plant had effluent treatment installed but it just goes and pours the effluent out through a canal into the river and does not even use the facilities. The same thing happened in the US. We have what they call midnight dumping—some pipes going into the rivers get very active between 12.00 and 3.00 a.m. in the morning in the US even now.

We have citizen suits in the US to enforce our pollution laws. The Natural Resources Defence Council (NRDC) sued Bethlehem Steel which was massively polluting the Chesapeake Bay and we have obtained a fine against the company which still has to be imposed by the judge. It could be as much as a hundred million dollars. We will have to collect that fine and give it to a fund. The company—the second largest steel company in the US—is saying that it may go bankrupt because of these losses.

Law suits are a very powerful tool. We have 50 law suits going against different companies right now and we win almost all of them, partly because EPA requires the company to monitor its own pollution. Many of the companies have filed information with EPA and they themselves show that they are violating the pollution laws. It is quite easy for us to prove that they are violating them. Under our law, for every day they violate the pollution law, they should be fined $50,000. That is a big deterrent and the interesting thing is that the department of environment here is actually considering the possibility of allowing such a thing in India. I think it will be the second country in the world to do that, and it will be an amazingly powerful tool.

This question of information is also very important and if India is to develop pollution control laws, it should avoid the situation that obtains even in Britain where information about amounts of pollution is kept secret from the public. We have to get access to information. It will save so much time in both getting it and bringing cases against the polluting industry. I think the US public perhaps has a hard time understanding the situation of Indians in rural areas or of agricultural problems. But one thing the US public understands pretty well is pollution control. I think there will be a lot of international solidarity on both pollution and workers' health problems.

# People's watchdogs: Link and multiply

ANWAR FAZAL

I would like to describe my own experience and that of my organisation, the International Organisation of Consumer Unions. We have worked for the last 15 years in the consumer and environment movement and basically the areas in which we have the most valuable experience is in *linking* and *multiplying*. I use these two words to signify the kind of work we have been doing.

One of the links we try to forge is the link between our *inner environment* and *outer environment*. As consumers, we take things in, we consume, but these things are linked to the outside world, first at the production level and then at the disposal stage.

We also try to link the *grassroots* and the *sky*. We often have a situation in the world today where there are a number of organisations that are travelling very high in the sky: either they do not know how, or forget, to land, or if they have to land, they need a very long runway. Then we have grassroot groups that are so busy working in the grass that the grass grows so tall that they cannot see beyond their immediate situation. The link between the grass and the sky can and must be made, and we have done a considerable amount of work in that area.

A third link is between the *head* and the *hand*. People get to know the development issues in areas they are working in, other people do something about these issues. There are organisations which are very good at elaborating these issues but hopeless in doing anything about them. Then there are issues on which organisations are very good at doing things but quite bad at

**Indiscriminate pesticide spraying in the Third World is causing untold poisoning of people, freshwater fish, water supplies and food crops.** BILL SANDERSON/IOCU

conceptualising problems. We try also to help in bridging the head and the hand.

The fourth link is between *issues* and *processes*. One of the things we find in our work is people get more involved in specific things like pesticides and pharmaceuticals, and we gain a lot of experience. Very often, there are structural problems involved and what we learn in dealing with one issue is equally important in any other issue that we are dealing with. We then begin to focus more and more on processes, and we can work with people in making key changes. They develop a new power and that power will help them determine their own agenda, in the manner in which they can do it. That process is more powerful. And many of the issues that we have been working on—whether pesticides, baby foods or pharmaceuticals—have been the entry points for involvement of people and for them then to learn and gain power to work on the issues they want.

There is also the link between what we call the *firefighting* and *structural* approaches. In this fifth link, we try to get a group to see both these two things. It is possible to have the firefighting approach, but does it have any value? If there were no fires, people would forget about the firemen; people will think that they do not exist. If there are fires, and if you need to put them out, be a fireperson. At the same time, we have to learn how to make sure there are no fires. We have to learn to prevent them in the first place. And so the link between fire-fighting operations and structural aspects is another we try and make.

Very often, I put this idea in a story. It is just like people trying to save a baby drowning in a river. They save the baby and before they have finished saving the baby and are recovering their breath, they see another baby drowning. They go there to save the second baby and a third baby is there. They go and save the third baby. And they are so busy saving the babies that they have no time to look upstream where a man is throwing babies in. If we become aware of the link between firefighting activities and structural issues, we begin to seek root causes, looking upstream to see where the problems are coming from.

The sixth and last kind of link is how to make people see very *simple things* that they are doing and relate them to bigger *goals* and missions. We find this is also a gap, something that needs to be linked—how to get a person who is coming and working in our organisation on a small salary doing routine work to feel as important as someone who wants to make a new society.

I also tell another story to remind people about this link. When someone is going to a place where they are building something, and they see two persons who are building, they ask the first: "What are you doing?" He says, "I am laying bricks." They ask the second, who is of course also laying bricks, but he says, "I am building a school." So you see there are two kinds of perceptions of the same thing. One person has the vision and the other does not. We must make working people link their activity with a vision, a goal.

The second major area of work is about *multiplying*. We try, in each of the areas I mentioned, to multiply people who can do this kind of linking, who can develop as resources to work in all these kinds of areas. Let me give an idea of some of the ways we do it. One of the most visible ways is to constantly bring out publications. I will begin with Bhopal. About four months after the tragic event, our organisation brought out *Lessons of Bhopal*. It was not so much about Bhopal itself but the lessons that people could learn, and how they could organise around such issues and initiate action in their own community. This is the book which went round the world about six months after the Bhopal disaster. It was in a way a 'doing' book. It was a 'handbook'. And at the same time, we thought we should also have very soon a 'headbook' about Bhopal. And this book came out a year after that. It looks not at Bhopal but at all the potential Bhopals in the rest of the world.

We had investigative journalists who visited Taiwan, Korea, Mexico, Brazil and a number of other countries with the same kind of problem. We could analyse some prospects for ceaseless action needed in the structural areas, a deep look at the way we use pesticides in our society and we organise agriculture. Unless we change those things and also unless we change the way in which groups get access to information, we will never be able to break what we call *The Bhopal Syndrome*—the title of the book.

To give you another example, a book which came out just a few days ago was called *Adverse Effects: Women and the Pharmaceutical Industry*. It is a collection of articles on the way in which women are exploited by the drug industry. Another book is on how the multinational companies, basically big business, provide educational material in schools and propaganda that actually captures the minds of young people while they are in school. We call it *The Corporate Pied Piper*. In the US, for example, a larger number of educational materials are provided to the

schools by different businesses which make them pro the kind of operations that they have. If we look at it internationally, we find that in the Third World, people are starved of information and large companies very often offer to bring out publications. For example, in my own country, a company like Nestle or Ajinomoto will publish recipe books for home economics classes and this is where they are able to project their concepts of technology, and the way in which food should be consumed, into young people's minds right from the beginning.

There is again another kind of exercise. We pamphleteer and usually spend US $ 500 on issuing a four-page pamphlet where we investigate one problem—maybe one drug or one company or one kind of service—and just analyse that. It is designed just like a pharmaceutical company's leaflet or other companies' leaflets. We use some of the same techniques against them.

We do a small exercise like this, hold a press conference and send the pamphlet all over the world. Basically, we use about $ 500 to create hell for one company or one product throughout the world. This is a low-cost way of hitting back, an organised way of hurling paper aeroplanes—but ones with sharp points!—at others.

We have another project called Consumer Interpol. We try to get information about banned products reappearing in another country to a central place and from there, send it out to other groups that are working with us in this network. We have something like 50 groups that are interested in participating in this programme. So if the United States bans a drug, we will get the information out. If we find a product that is unsafe, an electrical product that might be dangerous, we will provide the background to it to ensure that that product is removed from the market. This programme also deals with *generic issues*. We have done special issues on asbestos, which may not be a direct consumer product, but is an industrial product. We are taking a number of generic issues—we are looking at food irradiation, at biotechnology, and at even seemingly simple things like batteries. There is the problem now in many parts of the world about the small batteries used in watches and calculators. Many of these contain heavy metals. Because they are small, people just throw them away and children have been known to put them into their mouths and they burst inside their stomachs. There have been deaths associated with this. In Switzerland, there are supermarkets with special corners to place these things. People there are looking at laws where by it will be illegal to do anything except deposit them in these places. We may need to change the chemical they use; there are some other chemicals that may not be so dangerous. This is a new, emerging problem. We would like to write a report on this for groups that might be interested in acting on this problem.

We are also doing something else that is very simple—like school report cards that are used all over. We thought we would write reports about what governments and companies do. As our first case we looked at the way in which companies were observing the WHO international code on marketing of breastmilk substitutes. We wanted to show how governments and companies were really observing this code. We listed the seven most important parts of the international code and we indicated what each country has done about the code, whether it has incorporated it into law, whether it is voluntary or non-existent there. Every country—and there are 156—has got a report that we have given about the way in which they are observing this international code. This whole exercise cost us only $1,500. It is a low-cost operation. We were able to do this because we now have an international network of people. We can write to somebody in India—there are three people here—who can tell us what the situation in India is. And just for the postage and the commitment that the people have to this kind of work, they will respond. Through this, we were able to go right through 156 countries. India is also listed. We understand that a law will come up very soon and that it is already in Parliament. India is one of the leading countries in the world for advertisements for pacifiers. This country is heavily promoting feeding bottles and teats and since those are the instruments by which infant formula is given, they become the technology by which people are hooked. Under the international code, even bottles and teats are not allowed to be advertised; this is, of course, a voluntary code and since governments are all independent, they can decide what they do not want to do. Through this new programme of report cards that we have begun, we hope to spur, if not shame, governments and corporations into action.

The last thing is a book called *Generating Power* which is about organising people and increasing the power of ordinary people to deal with their problems. We hope to do more and more of this kind of multiplying work.

One of the structures, the framework, for all this linking and

multiplying has been global networking and networking is a word all of us are familiar with. The essence is how do we use the strength of weak links. That is a phrase used by someone else—"the strength of weak links". How can we work together without necessarily having to agree on everything? If you have something to give and I have something to give and we both agree on one issue, let us together work on that. That kind of working has brought organisations together over the last seven years around issues in ways that were never before conceivable. The baby food campaign got together something like 300 or 400 organisations. There were many which never worked together. Some may even be antagonistic to each other but we learn that if we take up issues, we can agree on a limited programme and on that we can move. At the same time, no one is preventing an organisation from holding its own views on that programme and it can take even stronger positions. This concept of having the freedom to do one's own thing yet at the same time link up with other people has been the strength of networking. And it is that kind of feeling that went into the formation first of the International Baby Food Action Network (IBFAN) and then into Health Action International (HAI) and then to something which is very close to all who are working in environment, the Pesticide Action Network (PAN). One of its very special features was that when it was first suggested, people said, "Ah, we are doing another network." People start taking a good idea and implement it. But the process of implementing can become a problem too if it does not go through the kind of process that it should go through. It should not be someone at the top who decides a network is needed. For example, there was once a suggestion that there should be an international meeting in Holland of all the groups working on pesticides and then we would form the pesticide network. A number of us, both from the North and South, felt that this was not the way to start, because if we do that globally, what will happen is that there will be 700 people from the North and may be 70 or seven people from the South and then we will have an 'international' network. But we needed to start with a completely different framework and power base. So we said, "If you want a network, first the groups in the Third World will meet." So we had the first meeting in Asia, the second in Latin America, the third in Africa, the fourth in Europe and the fifth in North America.

In this way, by reversing the process, we got very strong

Third World involvement and also we were able to get groups in the Third World organised, for both local involvement and for global work. Since a large number of the problems were global, involving multinational companies, people began to feel the need for this initiative from the Third World and when we had the international meeting, we had an equal number of people from each of the continents. Even that was a bit unfair, if you look at the numbers in the world, but anyway, people then had the confidence and trust to organise and work together. We in the Third World are always very generous people.

So PAN was founded. One of the principles of PAN is how can we use constructively tensions within our own organisations, which is a very important principle. We have organisations that are very assertive, that are confrontational. We also have organisations that feel—"I just want to help the people." How do we bring these kinds of tensions together? That is one of the greatest challenges to get the best out of groups that are aggressive and also those that want to do educational, information work. We need to have a variety of programmes where all can lend a hand, like some can build the roof, some the floor, some the foundation, some the fencing and so on. The second thing is for all of us to agree on what are the pressure points, what needs to be changed on an issue. For those things that we can do together, we will work together. At the same time, if there is a point on which a group wants to act on its own, go ahead. But if one wants to do something let us try first to develop a consensus and add strength to our work.

There are five basic ideas that we have found very useful in these networks:

Firstly, we have always got to *think political*. People are afraid sometimes to think about politics. We have to confront the political structures, the politicians, we have to learn how to be quite good at that. We have got to find out how we can heat their backsides! We have to learn how to be good at predicting how they will act and start moving. So we have to think political and about political structures, both local and international.

Secondly, we have to *think leadership* in a completely different way. If we take any of these networks, there is no leader, there is no chairperson or anyone. We say everyone who is in the network is the leader and one can become a member of the network by participating, by taking action, and that is leadership. For us, in our work, and in all the networks we see, our job is not to get more followers but to build more leaders, and if we accept that concept, we think completely differently about the way we work. We are always looking for people who can join us but we want them to become leaders in their own right. This way we multiply our own strength. This way also our strength is everywhere and it cannot be destroyed because we can kill one leader, or 500 leaders, but there will still be a thousand more left and they will be multiplying.

Thirdly, *think everywhere*. There is nothing more frustrating for politicians or for multinational companies than to know that the movement is all over the place and activity is coming from all over and supporters are all over. If it is the Chipko movement and if the support for that kind of work is coming up from all parts of India and from all parts of the world, it gives a completely new dimension! So add that concept to our mind-set: *think everywhere*.

Fourthly, we found that in this kind of campaigning we needed to *think surprise*. We too have to have our surprises. In order to capture the imagination, we have to capture the attention of the press, of politicians. We have to devise ways and means to surprise our opponents.

The fifth, one of the most important parts of our networking, is the importance of *mutual respect* between groups. We all may be different—we have different styles but we respect each other. We may disagree with a group but we have respect for it and when we work together, we will work together. If we have to fight, we will fight sometime, where it is necessary to fight. We too in the meantime have the freedom to act on our own. But we must remember this aspect of mutual respect. From my own experience in working in citizen groups, so much energy is lost fighting each other. Energy is lost because of our internal quarrels; a lot of it may not be necessary. We differ, yes, but we must not lose our perspective. If we have this mutual respect, we can go ahead and do extremely well. So these are five, what I call the *"think five"*, useful principles in PAN and also in our other networks.

There are two other useful concepts I want to share. One is the concept of *hitchhiking*. Whenever we are doing things we always think, "Well, I can't do it, because I haven't got funds." But it is like travelling; if I want to go from Delhi to Kanpur, let's say I have no money to buy the ticket, I can walk there if I like. Or I can stay on the street and say: "If I can find someone else who's going there, who's got empty space, I'll jump on that car and go." Similarly, in our work, how can we hitchhike? If we find organisations that are doing similar work, we can cooperate and if the organisations possess certain strengths we can link up with them. The linking is very important: we can help others, others can help us, so hitchhiking is a low-cost way of multiplying, of getting things done.

Secondly, a kind of intermediate vision is necessary, which is very often absent in our society. This has been called, again by someone else, *helicopter vision*. We find people can only think very low, or they can think by aeroplane, but helicopters are different, they can land on one spot and they can go up and they can also stay at one spot. In our work, we should have the ability to take off and be able to look at bigger areas than just our own and study that and at the same time be able to come back and be able to land on the spot. Otherwise, we find that either we are just stuck or imprisoned in our own area or flying so high that we do not know how to land at all.

In conclusion, we always say in our work—whether it is pesticides or whatever—that we are *a force for happiness*. We keep on telling people that we are a force for happiness and remind them that we are not antidevelopment—we are for good development. We use this kind of terminology, because we think it is important all the time to remind people. Secondly, and something we often forget, is that everytime we have some success, even small, we must *take time to celebrate*—even holding hands and singing a song.

**Pesticide spraying without protective gear.** TOI

Thirdly, whenever we are feeling that we are losing remember that *we are not alone* and that there are so many other groups around in the world like us and some of them are winning and we will win too.

**Saint:** I appreciate the very positive and strong principles enunciated, the very practical methods. How do you try to come together? There are two kinds of problems involved. One is an ego problem, a very desperate need for recognition or central position that is not granted and then the determination to break whatever is trying to be formed. The second is the coming in of those with an intent to subvert and to destroy, almost as second nature. How do you deal with those kinds of individuals?

**Fazal:** Conflict is such a normal and common thing that if we have disagreements we should not worry. There is no need to get excited and unhappy about it. If someone gets angry for a while, by your calmness and reasonableness, a different kind of tone can be set.

But some people need 'ego'. One of the challenges with someone like that is what can we give him or her to do? In networking, we say, "Go ahead and do it, if you feel that idea is very good. All those you want as your assistants will follow you if your idea is good." He or she may find that other people do not want to go along on that issue and that slows the person down immediately because he or she cannot get support. In the end, it is a voluntary system and we have to gain the support of the people, so every time we have someone like that, we encourage the person. One of the ways of coping is to make sure that there is already a trust amongst the people working in the group, so it is easier also to deal with one individual who might be a bit more egoistic.

I have a rule—the Fazal Rule: 'The degree of cooperation between organisations—similar organisations, working on the same issues—is inversely related to the distance between them.' That means the closer people are and the more similar people are, there is less likelihood of them being able to work together, because there are certain suspicions and tensions. Very often, when people are in the same area, the reason why we have five groups is that we may represent five different interests in that area. Groups that are far away do not have that sort of sense, and that is why we have found that linking globally and linking beyond our own small areas gives us a new way of cooperating without feeling threatened by the edicts of 'Delhi', for instance. We do not compete in the same market because basically there is a much bigger area of operation. However, some of the competition will still exist. For example, we have three groups in Penang very active in public interest issues and very often, the vertical links may be much, much stronger than the horizontal links. That is the nature of human organisation. I think if we know that these tensions exist, we can anticipate them and have structures that can cope with them.

Saboteurs are much more difficult to deal with and one has to be constantly worried about them. This calls for alertness, to realise that someone is coming to destroy your campaign. Maybe we should do things in such a way that at least whatever bomb he or she plants, will be under his or her own backside and if anyone gets blown up, it will be the person planting the bomb. That requires an understanding of human nature.

It is a tribute to us that Nestle formed a company bringing out a journal called the *International Barometer*. It is heavily staffed with a budget of several million dollars. The only thing it is doing is to monitor pressure groups; that is why they call it the barometer. Each issue is sold at $500 to all the multinational companies or anybody else who wants it. Every issue monitors groups that are working on environment, pesticides, baby food, anti-nuclear issues and biotechnology. They spend that amount of money just to have an intelligence service, to know nothing else but the kind of work that these networks are now doing.

The second thing is the Heritage Foundation. It is a very wideranging think tank which is headed by a former CIA person. Jean Kirkpatrick is one of the Fellows of this foundation, which has become very strong over the last few years. It is part of the Big Right or New Right or whatever they call it in the United States and they decided to have a multimillion dollar project on attacking the UN system because the UN system they say is controlled by Third World people. They did a series of studies—the first published was on the International Consumer Movement. They said the International Consumer Movement is anti-American, anti-companies and anti-TNCs and must be destroyed. It is run by a number of crazy people, 'some wild men from Borneo', and

that is a threat to the American system!

The second report was on UNICEF. They said it is a terrible organisation, because it is working on peace while it is supposed to work only with children! How can it be dealing with peace, when peace is a dangerous thing? Secondly, it is working with the International Organization of Consumers Unions and trying to stop the marketing of baby milk. It is not the job of UNICEF to get into marketing! See the concepts that they were pushing?

The Heritage Foundation is a very influential body within the conservative leadership in the US. They have a strategy, with a special name. It is called the 'End-Run' strategy. They know that every human organisation has a structure. They find out who is on its board and they will go to one person who is very active. The End-Run strategy is to let the person they have influenced ask questions: Why are you doing this? Have you got our approval? And so on. When you are involved in a campaign, you suddenly find from behind your back, your board is creating problems for you. They have a lot of strategies like this that were tending to destabilise or upset us.

We now find that because of the way in which we are organised, because we are global, because we have got these networks and because of the work that we do, we are confident and we make sure that we do things well. If we make a mistake we know that people out there will be waiting to bury us. We have to have credibility in our own work and globally with the media—that will make them very afraid to be nasty to us. Their only recourse is the dirty way from the back.

I will tell you about a Japanese company, Ajinomoto. They pay journalists to come to our conferences to create problems. They ask questions like "Is it true that the Consumers' Union of Japan is against everything, including the Emperor?" And this, in countries like Japan and Thailand where the king is very important.

There have also been attempts to bribe. We found that there were people coming to our press conferences, whose tickets had been paid by companies. But because we are beginning to understand the people whom we work with, we know who is different—we can smell the person, very often!

**Agarwal:** I want to know what have been the highlights of the work done by the Pesticides Action Network over the last two or three years? Is there much work going on in this field within India?

**Fazal:** The greatest success of the Pesticides action Network is that there are some 400 groups throughout the world working with it. They are talking to each other and doing campaigns in their own countries now with a new kind of confidence that they are not alone and that there are materials available to them that they can share. That has been the greatest success because the greatest battle will have to be fought in those countries.

The second success is that we were seeking to get an international code and within a period of three years, FAO has adopted an international code on the marketing of pesticides. Unfortunately, it is a code that is not particularly good. It is one of these "lowest common denominator" instruments, but its value is that it has got certain basic regulations. Since more than three-quarters of the governments of the world have nothing by way of pesticides legislation, it gives us a hook to organise our own campaigns to say "If there are certain international standards, our government must have some laws in our country and begin to take action."

This is the second international code—the first was on marketing of infant formula—and it has given us a focus within the UN system to discuss this issue: it has given local groups a focus to organise around this issue. We want the UN to strengthen the code. One of the weakest things is that no country can export a pesticide if they do not get the consent of the importing government. The EEC countries objected to that and the Third World's Group of 77 gave in. They said, "Never mind; since we want a consensus, we will not push for this." Otherwise by vote, the Third World could have got that included but it said, "We will wait for two years and see how this code is operating." If the developed countries continue to dump pesticides that are banned, we will rethink this around November, 1987. This is the situation on the code.

The third achievement is a global public education campaign which is entitled 'The Dirty Dozen Campaign'. For the global campaign we thought it would be good to focus very specifically on pesticides and use 12 pesticides as a way of getting people to discuss the whole way in which we use chemicals in our society. The idea is not just to ban those 12; it is a tool to get the attention of the press. Having got people's attention, we ask: "Do we need the pesticides in the first place?" They can ban all 12 and still get away with it.

Our press kit is a common tool and has been translated into French and Spanish and spread throughout the world now. It is amazing—we have press cuttings of the way in which this was dealt with formerly and I have not seen any public campaign that I have been involved with over the last few years where there was so much press coverage. In over 57 countries, this was the lead story in one of the papers. It got that kind of public attention because it was hot. Every paper likes to make pesticides that are banned an issue in its own country, so it gives a lot of support to local groups to firm up their campaign on pesticides.

So these are three major areas of success. In terms of the future, we now have a regional structure within PAN that is always looking at the agenda. At the moment, it has two other very important things and these are going to be more and more significant. One is the whole question of alternatives. If we do not want to use chemicals or we want to use chemicals only as we use medicines, as a prophylactic, what are the alternatives? These are now being looked at in several projects within the PAN network. One way is through case studies. We are looking at 12 case studies in the world. The project is funded and operated by the Consumers Union of the US. We ask, "Where are alternatives actually succeeding?" It is easier to talk about alternatives where they are succeeding. A book is going to come out very shortly.

The second issue is biotechnology. Many companies that are making chemicals now are forgetting about chemical pesticides, because now they are going into laboratories and they are going to make new genes and plants. They are going to make rubber and vegetable oil in their laboratories. They are going to take that big leap forward so that we do not need pesticides, we do not even need to grow things, we do not need farmers, we will just have factories where we will get vegetable oil or vegetable rubber like synthetic rubber. We will get all kinds of things we would normally classify as vegetables in our own laboratories.

We can see the transformation that might occur. It might be at the cost of the world's system of agriculture and other things. The whole biotechnology area is developing very rapidly. I think it was DuPont or somebody who was the president of a major company who said, "You know we are going to give up pesticides in the next few years. In the next 20 years we will hardly be producing pesticides. We are already moving on the biotechnology and chemicals will be a sunset industry." What will happen is that more and more pesticide manufacture will, in fact, be done in the Third World. This is where we will have all the factories, we will be copying this very old sunset technology and at the same time be confronted with biotechnology in our factories. Whether we are ready to cope with all this we do not know. Groups are beginning to discuss these things and they will come to the first international NGO conference on biotechnology which will be held some time in 1987.

In the Pesticides Action Network, India is a blank in our map at the moment. We have got good contacts like the Voluntary Health Association of India, Kerala Sastra Sahitya Parishad, Centre for Consumer Research and Education in Ahmedabad, and a number of groups in Bombay who send us press cuttings. We get materials from them but as a campaign, as a networking base, at the moment there is a void here.

**Agarwal:** We often get letters asking us about the harmful effect of a certain pesticide. I have often found it difficult to turn to somebody within this country to get information about the harmful effects of specific pesticides. Have you developed a centre to which we could pass on such queries or get information on specific pesticides?

**Fazal:** Yes, both from Penang and San Francisco, and through the network with the Natural Resources Defence Council. In Penang, we now have very good documentation on this, so if you need information, we will get it for you. If we cannot get it for you, we will tell you where you can get information on any pesticide that you can think of. Give it to us by the brand name or chemical name.

# Financing development or destruction?

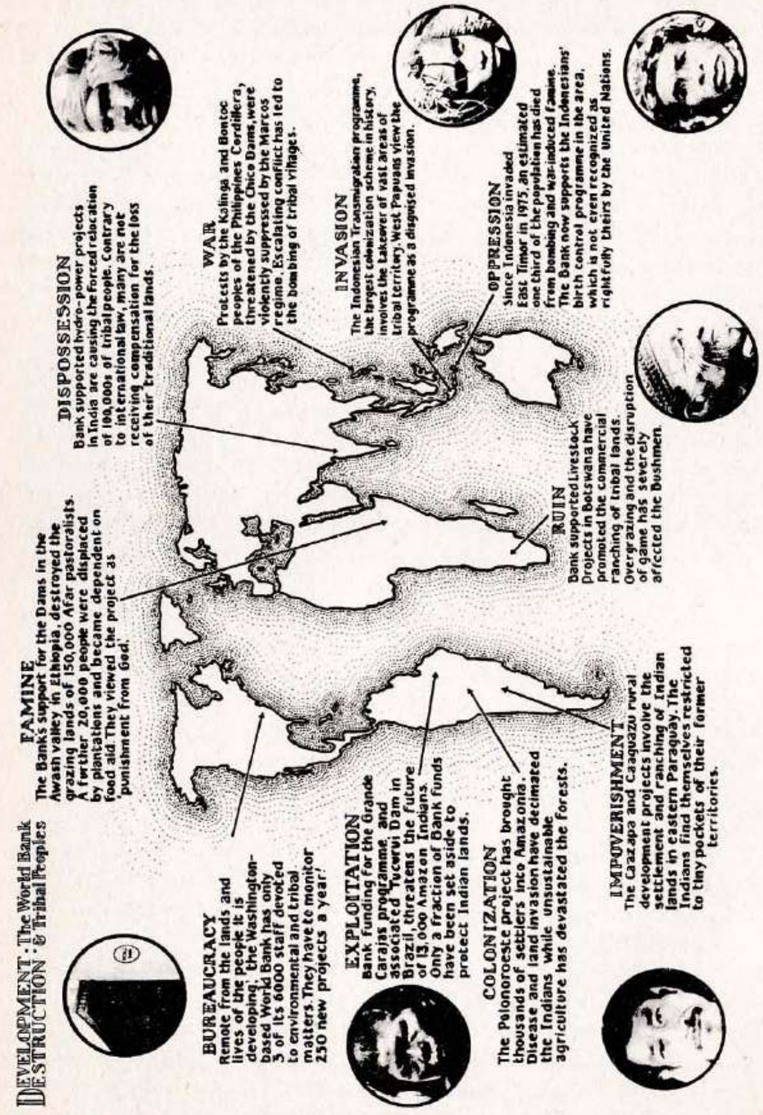
PATRICIA ADAMS

My project at Energy Probe covers environmental issues that involve Canada with other countries. I have spent most of the last few years working on the environmental effects of Canadian aid and trade policies, especially in the energy areas. I will try to describe a few prominent cases we are working on, and I will try to explain the importance of these cases to the global environmental movement and to the subsistence of people around the world.

Whether our campaigns are local, national, or international, in each case we find the principles we argue from are identical. And the first principle is that the best way to make the decision-making process accountable is by having the people who make the decisions be the ones who must live with the consequences. Protect the civil and human rights of people, give them control over their environment, and they themselves will become the fiercest protectors of their environment.

What we love doing most, and what we feel we do best, is expose the structural flaws in the decision-making process that lead institutions like our governments and corporations into unsustainable energy policies. We have discovered that the lessons and principles that come out of our analysis are in no way restricted to the energy sector.

The work we have done trying to find out about development projects has led us to a couple of very interesting findings about how the World Bank operates and what is true for dams is true for every project. And I am also discovering that it is true for small projects as well.



DEVELOPMENT · The World Bank
DESTRUCTION · & Tribal Peoples

**FAMINE**
The Bank's support for the Dams in the Awash valley in Ethiopia, destroyed the grazing lands of 150,000 Afar pastoralists. A further 20,000 people were displaced by plantations and became dependent on food aid. They viewed the project as 'punishment from God.'

**DISPOSSESSION**
Bank supported hydro-power projects in India are causing the forced relocation of 100,000s of tribal people. Contrary to international law, many are not receiving compensation for the loss of their traditional lands.

**BUREAUCRACY**
Remote from the lands and lives of the people it is developing, the Washington-based World Bank has only 3 of its 6000 staff devoted to environmental and tribal matters. They have to monitor 250 new projects a year!

**WAR**
Protests by the Kalinga and Bontoc peoples of the Philippines Cordillera, threatened by the Chico Dams, were violently suppressed by the Marcos regime. Escalating conflict has led to the bombing of tribal villages.

**EXPLOITATION**
Bank funding for the Grande Carajas programme and associated Tucurui Dam in Brazil, threatens the future of 13,000 Amazon Indians. Only a fraction of Bank funds have been set aside to protect Indian lands.

**INVASION**
The Indonesian Transmigration programme, the largest colonization scheme in history, involves the takeover of vast areas of tribal territory. West Papuans view the programme as a disguised invasion.

**COLONIZATION**
The Polonoroeste project has brought thousands of settlers into Amazonia. Disease and land invasion have decimated the Indians while unsustainable agriculture has devastated the forests.

**OPPRESSION**
Since Indonesia invaded East Timor in 1975, an estimated one third of the population has died from bombing and war-induced famine. The Bank now supports the Indonesians' birth control programme in the area, which is not even recognized as rightfully theirs by the United Nations.

**RUIN**
Bank supported Livestock Projects in Botswana have promoted the commercial ranching of tribal lands. Overgrazing and the disruption of game has severely affected the Bushmen.

**IMPOVERISHMENT**
The Caazapa and Caaquazu rural development projects involve the settlement and ranching of Indian lands in eastern Paraguay. The Indians find themselves restricted to tiny pockets of their former territories.

— SURVIVAL INTERNATIONAL

Let me start by telling you about a campaign that I have been working on that directly affects the citizens of the Third World and then move on to some domestic issues that are remarkably similar to these situations. In some ways, it is an extreme example but I think that it is important because it shows what few rights we all have, how far wrong an aid project can go, and how abusive an aid project can be.

Several years ago, Energy Probe started receiving letters from citizens' groups in the Third World telling us that Canada was financing this hydro dam or that irrigation scheme, through the various aid agencies we support and that these projects were destroying the environments on which many thousands of people depended. In the process of trying to stop our aid dollars from causing harm we discovered, to our horror, the remarkable unaccountability of international aid institutions to the citizens of the Third World.

I want to describe this remoteness of the international aid agencies by concentrating on multilateral development banks, such as the World Bank and the Asian Development Bank, in which all our countries are members. But I do want to emphasise that what I am about to describe is also true, in varying degrees, for the national aid agencies like the Canadian International Development Agency (CIDA).

Here is one case that illustrates only too vividly how people in the aid-giving and aid-receiving countries are excluded from the aid decision-making process. Several years ago, the Inter-American Development Bank financed a feasibility study of two hydro dams in Haiti with the intention of eventually financing construction of the dams. Because the dams would flood vast tracts of prime agricultural land—an area dubbed the breadbasket of Haiti—the project met with widespread opposition from local farmers, the church, rural development workers, and from human rights groups and environmental activists around the world. Local agronomists and economists conducted a detailed counter-study of the effect of the dams and discovered that the country would lose the capacity to produce food for some 60,000 Haitians annually.

Because CIDA had paved the way for these dams with the original hydrological assessment, and because CIDA is responsible for Canadian participation in the Inter-American Development Bank, I asked the acting President at the time for CIDA's reaction to the counter-study. CIDA refused to comment, saying it was not their policy to comment on a project that was not their own. So then I asked the Inter-American Bank. Like CIDA, they too refused to comment.

I had also asked CIDA for a copy of the official feasibility study for the dams, which was supposed to include an environmental assessment. CIDA said it was not theirs to give. It belonged to the Inter-American Bank; they said "Ask them." I did. The Inter-American Bank said it belonged to the Haitian Government, and suggested I ask them. I did. The Haitian government of Baby Doc Duvalier did not respond to my request.

At the same time, the Haitian communities that were going to be affected by the dams also asked the Inter-American Bank for a copy of the feasibility study. They were also refused. Needless to say, they did not dare ask the Haitian government for the document. It was a fairly brutal government and their lives would have been in danger.

So what became painfully clear was that the aid agencies were not interested in providing information or in receiving outside input about the likely effects of their dams. No public discussion of the costs and benefits was countenanced. A handful of Bank and Haitian officials would decide, in isolation, whether to flood Haiti's breadbasket.

An enormous lobbying effort by the Haitians, with help from groups in Canada, the US and France, finally pressurised the Inter-American Bank to postpone construction of one dam till 1990 and the other was cancelled. But most Bank projects do not get this kind of international scrutiny. It seems that only when enough local and international outrage is summoned can those threatened by these damaging projects fight for their rights—and only some of the time are they successful, as we well know. For the dozens of other projects as yet unnamed and unknown except to the banks and their clients, there is not even a battleground.

Why do these abuses of people's means of subsistence happen? The important lesson that we all learnt from this case was that nobody felt secure at the end of it. None of us feel confident when we do succeed in getting a hydro dam stopped or postponed because there is always a good chance that it will be resurrected and if it is, there is no reason to believe that the people affected will have the chance to participate in a fair review and decision-making process.

I must say that I would add the national aid agencies to our

list of the people who have an interest in seeing these hydro dams go ahead. I do not want to imply in any way that these people are driven by a sense of ill-will. That is absolutely not the case. But I think there is a certain inertia. There is a lot of pressure on people in aid agencies to spend a lot of money. Each year the world's international aid agencies spend about $30 billion. They are the largest developers in the world.

The reason aid projects that are so harmful to so many people go ahead is because the multilateral development banks are not subjected to any kind of scrutiny. These abuses happen through neglect. Because the banks are unaccountable to the public in their member countries. The banks operate in isolation under an extraordinary degree of secrecy. They vigorously lock out attempts by their members—that's all of us—to set guidelines for their operations. They are laws unto themselves.

The effect of the banks' isolation from the taxpayers that keep them in business and from the people of the Third World who are the presumed beneficiaries, is an unchecked relationship with their clients—the recipient governments in the Third World

For example, none of us, as taxpayers or as borrowers, are permitted to see environmental assessments, or any other kind of documents for that matter, which from the basis of the banks' decision to go ahead or not to go ahead with a project.

This means that neither the people in the developed world as the financiers, nor those in the developing countries as the ones affected by the project, have the right to see, for example, what value the World Bank experts assigned to the loss of economy of the 200,000 people in the Narmada river valley when they decided to flood part of that valley with dams. Nor can the citizens of Central America see if the World Bank experts included the costs of destroying plant species when they calculated the costs and benefits of converting tropical forests into cattle ranches. When the public in the recipient countries or in the donor countries try to present the banks with their concerns about projects they are either ignored or told, "Don't worry, we have taken that problem into account. Trust us." But there is no reason to trust them because they have a terrible track record. And it is no surprise that they have such a terrible track record when we realise that the banks are operating under a serious conflict of interest.

I am talking now about the multilateral development banks, but I think the way in which these multilateral aid agencies operate is applicable to bilateral aid agencies as well, for example, CIDA. I think there is one exception to this rule and that is USAID, which has a much more open review procedure than most other aid agencies.

This is where the conflict lies—the banks do the cost-benefit study, or the environmental assessment, for their own project. Then without any outside, independent or public scrutiny, they decide whether the project goes ahead or not. The banks are both promoters and judges of their own projects. The banks—the world's largest developers—are not regulated or checked in any way.

There is nothing inherently wrong with developers or promoters extolling the virtues of their project. That is to be expected. But in the case of the banks, their assessments are the first and the last word on the matter. Because their assessments do not have to pass the test of independent public scrutiny, the present review process is rendered virtually useless. This secretive, isolated, unscrutinised manner in which the banks make decisions is, in the most fundamental way, anti-development. It excludes the people of the Third World--the very people with the most information about the carrying capacity of their environment, with the most interest, and with the most responsibility in maintaining a sound environment—from the decision-making process.

So what are citizens' groups doing to reform the banks in order to eliminate this conflict of interest and make the banks more accountable to the public in the member countries? Quite simply, we are trying to open up the banks' decision-making process to outside, independent, public scrutiny.

For a start, we are pushing for disclosure of banks' documents to the public of all member countries. The public must be able to see the environmental assessments, feasibility studies, and loan agreements between borrowing Third World governments and the bank before they are signed. Because it is in those loan agreements that conditions for protection of the environment and of the affected populations are laid out. Otherwise, by the time many of us discover that these projects are environmental and human calamities, it is too late. The contracts would have already been signed, sealed and delivered.

Next, we are calling for a mandatory review process that allows the public in all member countries, but especially in the recipient countries, to challenge the promoters on the very

economic value of the project. The public review helps determine whether the benefits outweigh the losses. In this way it helps root out environmental and economic boondoggles. Public reviews also promote human and civil rights by exposing winners and losers, so that due compensation can be paid and injustices stopped. This must happen before commitments are made to contractors.

The public review process is something that we are fighting for in our own country, because I think that public assessments, and the exposure of the assessments done by proponents, allow us to expose how crazy some of these projects are. And in the process, we are really able to root out those projects that are disasters in the making. I think also when we have a public review process, we are more able to expose who is going to win and who is going to lose because of a project, and my experience has been that when that is exposed, we can usually rally a lot of support. I think that people are offended that other people should be hurt, especially in aid projects. Because people in the West, I think feel proud of their aid money, they feel that they want to help. And the moment they discover that the money is actually hurting people, they feel a very real sense of outrage.

The public review process also promotes discussions about alternatives and alterations to these development projects. This public debate over how to use a country's resources is, to my mind, a necessary prerequisite to sound development in any country, including Canada.

At home, Energy Probe is fighting to open up the decision-making process of the domestic institutions that, like the aid agencies, make decisions that threaten our communities, our water, our air, our food, without consulting us. They create the risks that we must take. We have officials in Canada who, just like the officials from the international aid agencies, say, "These matters are too technical, too complicated for the public to grasp. We will make the decisions for the people." The Canadian public has had enough of the decisions made by the experts who have miscalculated the risks that we want our families and our communities to be subjected to.

Let me give one example. In Canada, we have a little-known federal law called the Nuclear Liability Act. It was drafted in response to the nervousness of the nuclear utilities and companies like General Electric and Westinghouse who were supplying the parts for nuclear reactors. They were worried about going bankrupt trying to pay damage claims in the event that their own technology went horribly wrong.

So in 1976, our federal government passed the Nuclear Liability Act, which limited the risk of the builders and operators of nuclear power stations. First, it ensured that companies constructing the plants were protected from damage suits. If one of General Electric's valves fails and leads to a nuclear accident where people and property are hurt, General Electric is not liable for one penny of the damage caused. Secondly, because the insurance industry knew too well that insuring a nuclear operator without limit could well bankrupt it, the government was forced to put a limit of $75 million of the operator's liability to claims. This is a ridiculously small coverage. The US Nuclear Regulatory Commission's own estimates of possible damages from a reactor accident surpass $300 billion.

Nuclear technology can cause a lot of damage. And the nuclear industry knows that. That is why it demanded protection from responsibility for its own technology in Canada, in the US and apparently in all other countries with nuclear power programmes. Energy Probe is starting a campaign to have this act thrown out on the grounds that it violates the public's civil and property rights. As the Canadian public is slowly learning of the existence of this Nuclear Liability Act, we find more and more people saying, "If those nuclear operators and contractors do not want to stand behind their nuclear plants, we do not want to stand in front of them."

There are many other examples in Canada where citizens' groups are challenging the experts' opinions of what is an acceptable risk. We see it in the debate over what is a safe level of dioxin in our drinking water, what is a safe level of herbicides in our food, and whether or not it is acceptably safe to spray our forests with the chemical cousin to Agent Orange to rid our forests of uncommercial tree species. Citizens are organising to challenge the corporate and government experts' assessment of what are 'acceptably safe levels' of risks that the public should take. And Canadian citizens, like those in the Third World, are saying to the institutions that have subjected us to a whole, battery of these risks in the past, "Enough, we want to make these decisions ourselves."

To do that, we need independent information about the effects of the hazards, the development projects, the technologies, and the regulations that so dramatically affect our lives.

Much of that information we get from each other through our own networks. But to be able to properly scrutinise the schemes that our governments, corporations and international institutions are planning for us, we must have fair warning, before they are given the go ahead. And we must have a fair decision-making process that lets those who have to live with the consequences of a decision be the ones who make the decision.

Energy Probe has been very much influenced by the Indian environmental movement. At home, we tend to make a distinction between groups that are engaged in helping the Third World to develop—they tend to be small groups and they have projects in the Third World—and other environmental organisations, and I think it was not until we started talking more to Indian environmental or citizens' groups and read their material, that we began to understand that what we were really doing was working on development at home. We were very concerned about who is making the decisions for the average Canadian citizen, who has made that decision to build the largest nuclear power station in the world outside of Toronto, 35 miles away. Our philosophy is that the best way to develop, in an environmental and sustainable way, is to put the power of the decisions on development into the hands of the people who have to live with the consequences of those decisions. Usually when we find that there is a crazy project that is going ahead, that is hurting people, it is usually because the people who have to live with the consequences of that decision have not made it.

**Saint** : What is understood by social assessment?

**Adams:** I have never seen one, but my impression is that they are assessments of what will happen to the people who are affected by a dam or any project. I think that it may be more of a plan than an assessment in the sense that it would say: 'Here is the best way to deal with resettlement' or 'Here is where to put people, here is how to group them.' In many cases, I guess, they may get an anthropologist to assess what would be the best way to move them and of adjusting people to the new physical environment. It does not necessarily have to be a resettlement programme. But I have never seen one.

**Saint** : I think something is beginning to emerge. Environmental impact assessment is now well understood, there is a

## Monitoring the MDBs

The multilateral development banks today play a key role in international development. By 1981, the Third World nations had borrowed some US 92.2 billion dollars from the World Bank to make dams and roads, generate electric power and for other projects. Over half of the MDB loans in recent years have been allocated to projects for agricultural rural development, dams and irrigation schemes, and roads. All these projects have a direct impact on the natural environment.

Opposition to indiscriminate and inappropriate funding of environmentally adverse projects has been growing steadily in the donor countries. Aghast at the way tax money collected from the public is being spent—to ruin rather than build—several groups in the West have been campaigning against the policies of the multilateral development banks (MDBs).

The key groups in the campaign are Probe International in Canada, and Friends of the Earth, Sierra Club, Environmental Defence Council and the Natural Resources Defence Council in the US and Survival International in the UK, These groups, working in tandem with local grassroots organisations, have been trying to halt the destruction in two major ways—firstly, by discouraging funding of projects without a proper environmental impact assessment (EIA), and, secondly, by trying to halt further implementation of those projects which have already been sanctioned, but which are clearly going to result in severe damage.

As one US national daily put it: "The World Bank has become the target of pressure group protests organised on an international scale. While officials of the IBRD met in Washington recently to draw up development aid strategies for the coming year, thousands of environmentalists were taking part in simultaneous demonstrations in seven capital cities worldwide." The angry demonstrators were calling for the immediate suspension of World Bank projects which, they claimed, were leading to massive environmental destruction. The projects cited were the Polonoroeste Project in the Amazon, the Narmada Project in India, and the transmigration schemes in Indonesia, amongst others. The Bank, say the campaigners, is breaking its own rules. Its charter says that it "will not finance projects that cause severe or irreversible environmental deterioration."

The campaign has already met with some success. In a signed declaration, the MDBs have acknowledged their responsibility to ensure the sustainability of the development activities financed by them, and to institute environmental impact assessment policies and procedures. As a result of the campaign, the World Bank cut off more than a quarter of a billion dollars in loans to the Polonoroeste Project in the Brazilian Amazon, which would have resulted in massive destruction of the Amazonian rainforest, disrupting the living environment of many aboriginal tribes who inhabit the dense rainforests. The Bank only resumed funding after the Brazilian government took steps to protect the various indigenous people and the environment. In the US, the campaign has resulted in 17 Congressional hearings on the environmental performance of the MDBs, leading to a 19-point environmental and social reform policy adopted by the US Treasury Department; adoption of a set of environmental policies and procedures by the World Bank in May 1984; the refusal by the US executive-director of the Inter-American Development Bank (IDB) to approve another road building plan in the Brazilian Amazon; and increasing access to information on the environmental aspects of development projects.

The campaign functions on the principles that the members of the executive boards of the MDBs are responsible to tax-payers in their own respective countries, and can, hence, be influenced through public pressure. Apart from agitating against existing and proposed unsound projects, the campaign stresses on involving citizens: "Ultimately, environmental, indigenous people's organisations, and other citizens' groups in the borrower countries, as well as borrower governments, can play the most important role in changing the development process. For this reason, citizen-to-citizen communication and cooperation between donor and borrower countriesas well as borrower governments, can play the most important role in changing the development process. For this reason, citizen-to-citizen communication and cooperation between donor and borrower countries are fundamental to meaningful change in development." says a recent publication of the Sierra Club entitled *Bankrolling Disasters*.

methodology and a set of guidelines that exist, and various countries have them. Even if such a thing as social assessment does not exist, and I think it should be an assessment and not a plan, it is an important concept that needs to be elaborated upon. There is plenty of evidence that in social assessment we should include the socio-cultural picture—what happens to the economic, corporate and collective lives of communities, what happens to their systems—so that there is an understanding of the existing systems prior to the 'development' impact. I was hoping that there is an evolving body of knowledge about this and to get some idea of this concept and what techniques are available. I think that at some stage, we should do more thinking on this.

Ui : In 1980, I attended a seminar in Rio de Janeiro, which was a training course for provincial government officers, organised by the UNEP regional office. And the main item in the discussion was the inclusion in so-called environment impact assessment of social factors, such as employment, income levels, and so on. And the people there agreed to widen this concept on these lines. Social impact assessment was recently made for a new airport in Ishinaki Island. A dozen social scientists and economists were asked to study the feasibility of the new airport independently and the whole assessment was kept secret, but somehow we dug it out and managed to find the social feasibility and it was published. And the local government had to answer the questions of the people.

**Kocherry** : We are now realising why there is such a compulsion to cover up these projects. First, it could be the lack of objective study and available data or things like that. Another could be pressure from some other interests. I do not know why even in Canada, there should be such confidentiality on these issues? Who is doing this? Why?

**Adams** : It certainly is the case that there are special interests in Canada who want these large projects to go ahead. And in the last couple of years these megaprojects have fallen by the wayside at home because they do not make economic sense and there is a huge public reaction to them. So now when we pick up a trade magazine that is put out by the government, all the good news stories about the exports of Canadian contracting engineering services are these megaprojects in the Third World. So that just confirms that there are vested interests.

But to answer the question about secrecy and who is trying to hide what and why, one of the official reasons that we have been given over and over again is that our government does not have the right to release information about another country; that these are essentially negotiations and deals that are made between two governments. It would be an infringement of the sovereignity of India, for example, to release some of these documents, even though the documents may in fact be financed by Canadian tax dollars. This is the first reason we are always given and it is quite an effective excuse. We can understand that when our government says that we are accused of wanting to trample on the rights of other people and their sovereignity. That is the traditional excuse and it is not surprising. Our government would not like the reverse. I feel it is important to realise that these are deals that are made between two governments but it may not necessarily, and in many cases does not, reflect the wishes of the people that those two governments represent.

**B. Choudhri** : There are attempts to study the social costs but even after studying it, social justice is not done in such projects. I will give an example. In the Narmada project, the people being displaced from Sardar Sarovar are tribals from Gujarat. They will be resettled perhaps in a non-tribal area in MP. And they will be divided. In a tribe, people live according to certain groups, and as all those people cannot be accommodated in one place, this will be social injustice to them. They lose all their relatives, their cultures and their lives.

**Laba** : My understanding is that most of these projects are based on economic cost-benefit analysis and social cost-benefit is hardly taken into consideration. There should also be a social opportunity cost—how much are you foregoing to have something else. And I understand that all these projects are designed to be located in areas where poorer people live. So ultimately we come back to the question of vested interests—the bureaucrats, the contractors, the multinationals and everyone else. Their moves are directed against a particular group of people who do not have much say. I think in the end it is a question of class, where a particular group of people are going to benefit from another group of people who happen to be minority groups and worse off economically.

**Sandbrook** : I would just like to inject some ideas into the dynamics of why these things are happening. I do not think that third party investment in dams has been so great in India, but in Sri Lanka or in Africa, the investment by multilateral or bilateral aid agencies has been very significant. The truth is that for the last ten years or so, and indeed longer than that, there has been a conspiracy of silence about the ill-effects of aid.

In the country from where I come, the development community has been pushing for development aid to a level of 0.7 per cent of the GNP for humanitarian reasons and good North-South relations and while we are pushing for more aid to be given, it does not really help our case to have the folly of current aid pointed out to us strongly. And, therefore, the difficulties of aid have tended to be hidden under the carpet. This very much applies to people who, in bureaucracies, are responsible for spending aid. Often they are in this part of the bureaucracy because they feel that the North-South balance was not correct. So the conspiracy of silence is the first factor.

The second factor is that with our raising questions, there are increasing pressures by governments who are not essentially interested in aid as a mode of addressing the North-South issue, but they are looking towards aid as a mode of delivering trade. And in fact aid and trade are very closely linked. About 8 per cent of Canada's trade is linked to aid. I would not like to put a percentage on British aid because it is a very fuzzy area, but certainly more than half our aid is tied to trade. There are tremendous commercial interests in the aid package.

My third factor is something of a *bete noire* with me, and that is that economists are, as it were, the new criminal class. Economists are so convinced by their own methodologies and their own way of arriving at conclusions. Economics seems to me to be a sort of chameleon science—it is not a science at all, although it is termed one—so that as soon as someone protests about economic theory, economics expands to incorporate that objection. It is called internalising an externality or some jargon like that! And so far economics has tried to internalise external costs, be they anthropological, biological or whatever. Many of the follies we see around us are due to economists who consider themselves to be in a position to make sane decisions. There is a tremendous parallel between struggling environmental movements on the one hand, and those who are trying to effect redress or change the quality of aid in the North. I am still not convinced that we should not give up the whole business of aid but until we do give up the whole thing, we should certainly try and redress it so that we do less damage.

**Kakabadse** : Until a year or two ago, large projects that were being implemented in Ecuador had to have an environmental impact study and that study was made by a foreign expert, usually from a country where the funds came from. It meant only a description—a geographical, geological, and flora and fauna description of the area—with no analysis at all. Because of the lobbying that has been done in the North, and from all the NGOs in the South, institutions like IDB and World Bank are very much afraid of being criticised. Every time anybody criticises them, all of them jump up and start making declarations. I was very surprised only two months ago, to be visited by IDB people in response to a letter from us, in which we said that the next environmental impact study of a particular project should be done by an NGO. Not only that, the project should be implemented by an NGO, if it was feasible. They came and said yes.

"Would you like to administer all the environmental aspects of this project?" I was terribly surprised, but I think there is a definite change, not in the mentality but in the approach of those people who are afraid of NGO criticism of the manner in which they have been administering these projects.

**B. Choudhri** : We have a system here whereby if an NGO raises some questions, then one simple way to silence it is to ask the NGO to do part of the job itself. Sanction it a small amount, place all the impediments in its way, and then incorporate it into the system.

**Chatfield** : I want to talk very briefly about a resource—the Dams Newsletter. I come from the state of California which at least until recently had 10 per cent of all the world's high dams. I am sure that with all the dam building in India and elsewhere that is no longer the case, but at least until very recently we had a lot of experience both in technology of how to build and how to stop them. Every single major river in California is dammed for a variety of reasons. It used to be so in California that irrigation and water development could get all the money they wanted. About four years ago, a man named Mark Dubois chained himself to a rock near a dam in a place that he and a group of other people called 'Bend in the River'. They had been fighting for several years and lost the battle. He chained himself to a rock and did not let anybody know where he was, and as they were filling the level of the dam, the rock where he was chained lay below the level that they were going to submerge. Such was the integrity of this dam-fighter that the officials believed that he was there even though they could not find him, and stopped filling the dam until about two weeks later when they finally discovered him, and sawed the chain; he had literally chained himself to this rock and he could not have got away. This gentleman has travelled extensively since then and was looking for some partners in the Third World to start a newsletter on international dams, particularly those financed by international money and by bilateral loans. It is called the International Dams Newsletter but it looked as if no one really had the finance and resources to do this and so he and a group of volunteers just picked up and started doing this. It is now in its fifth issue.

# Peace and ecology: Forces for survival

DAVID CHATFIELD

Three years ago I gave a paper at the European Environment Bureau-sponsored meeting on pesticide regulation in Schneverdingen, West Germany. I felt a little more qualified then to speak on the relatively more focussed topic of United States pesticide export regulatory policy than I do to discuss the relatively unfocussed theme of the major environmental issues in the US. There is a connection that ties them together, however.

An aspect of that 1983 paper was that a grassroots movement, concerned with toxic chemicals in the environment, was growing rapidly in California. I had just attended a meeting in Sacramento, the state's capital, in which dozens of activists fighting the local impacts of toxic chemicals on consumers' health, workplace safety, underground water, and farm workers, had come together for the first time to focus their considerable energy on a statewide level.

A similar conference held early this November in Sacramento, sponsored by the California Toxics Coordinating Project, was a direct outgrowth of the 1983 meeting and the unabated rise in public outrage over toxics over the past three years. But instead of a meeting where people learned about the potential power of joining forces, this was a meeting about how to wield already successful power.

Toxic hazards have become the number one environmental issue in California and the United States. Participants in the conference just finished were meeting in the aftermath of a successful political campaign: a public initiative on clean water allowing individuals to sue polluters and improving the public's right to know, passed by a margin of nearly two to one. In the election for Governor, concern about toxic chemicals was certainly the most visible single issue in the campaign. At the same time, more than 30 different pieces of legislation on toxic waste and pollution await action in the state legislature. They are blocked by the odd American political stalemate, caused by electing a Governor from one party (Republican) and a legislature controlled by the other (Democratic).

It is no small wonder that the issue has risen to the top of the agenda. Testing in 1985 of 2212 major California wells used for drinking water showed 447 contaminated with 24 different organic chemicals. In the San Joaquin Valley, the state's largest agricultural area, more than 2400 wells are undrinkable because of dangerous levels of DBCP.

The environmental and human impacts of toxics and the growth of hundreds of grassroots groups to fight it have become significant factors in US politics nationwide. Recently, a coalition of grassroots groups, statewide and national toxics organising groups (such as the Toxics Coordinating Project), and established environmental organisations, pushed the Federal reauthorisation of the Superfund Toxics Clean-up bill through a reluctant Senate.

For me, the most interesting part of writing this paper was the process of acquiring my points of views. I came to my conclusions about toxics not only through my experience, but by conducting a casual poll of a dozen or so friends at all levels of the US environmental movement. In applying this decidedly unscientific methodology, I asked two questions:

(1) What do you think are the two most important perceived environmental issues in the US today, and

(2) What significant trends within the movement do you see addressing these issues?

Everyone I talked to answered that toxics was one of the two most pressing issues. The group split widely over issue number two. The question of 'perceived' (what the public is responding to) and 'objective' (what my colleagues think is true) issues created constant debate. But in order of most frequently mentioned in my poll, the other major issues were acid rain, atmospheric pollution (including carbon dioxide in the atmosphere and the mysterious ozone hole over Antarctica), decline of the US agricultural resource base (soil erosion, pesticide and fertiliser pollution, development of prime agricultural lands, etc.), militarism as an environmental issue (including a nuclear test ban, disarmament, 'homeporting' of the Navy in major coastal cities, and the impact of conventional militarism on the environment) and high level radioactive waste disposal.

My small survey has obvious deficiencies, but probably carries a good deal of truth about which issues are important. It misses some of the most traditional issues of the conservation movement, notably wildlife and land-use questions. But to the extent that the issues in the straw poll are truly significant, I would like to make some observations about them.

Firstly, environmentalists in the US must develop work on a national energy policy. Such a policy is the principal means of dealing with acid rain and carbon dioxide build-up, phenomena caused by burning fossil fuels. There is scarcely any nationwide action on energy issues these days, except grassroots work on utility pricing policy. In California, for example, the effort to stop offshore oil drilling, a very popular cause, almost entirely lacks the analysis of how oil may be replaced more cheaply by energy efficiency and conservation.

A striking aspect of the list is the conspicuous absence of nuclear power, except for the inclusion of radioactive waste disposal. This is the opposite of the hypersensitivity in Europe to the issue since Chernobyl. Economic factors have moved capital away from a privatised—even if heavily subsidised—nuclear industry in the US. There have been no new orders for nuclear plants in the US since 1978. Progress on a progressive energy policy (the soft energy path), stimulated primarily by market forces, has created permanent energy reductions in California and elsewhere over the last six years. Since there are no new nuke battles to fight in anyone's backyard, the issue is not so compelling. Nuclear waste, on the other hand, has become an issue primarily because the waste must go somewhere, and no one wants it in their backyard. An important development here is the shift by state and local authorities, and local environmentalists, from simply saying put the waste somewhere else to questioning whether any solution is adequate. This kind of questioning will ultimately break the nuclear chain, and end the production of waste.

The gradual move of the mainstream environmental movement into issues of peace and disarmament is an important trend over the last decade. From groups founded on the assumption of a connection between peace and ecology (Greenpeace) to those

that in the last few years have made innovative forays to challenge militarism (NRDC's Soviet-American nuclear test monitoring), more groups have taken on the issue of war and peace. Even the more staid Sierra Club is gradually pulling itself into the debate. Cooperation among traditional peace organisations and the environmental movement occurs regularly. Environmental interest embraces both old issues—a comprehensive test ban and siting of land-based missiles—and concerns such as Star Wars 'defence' and homeporting, the Navy's effort to spread its influence by dispersing its fleet into major ports like San Francisco and New York. In each homeport location, for instance, the battle to stop it has been jointly advanced by coalitions of environmental and peace groups.

A number of environmental groups worked hard last year on the ecological aspects of the national farm bill. Congress passed incentives for farmers to conserve land, but it appeared to me that the broad question of economic survival of small to medium scale farms was difficult for environmentalists to embrace effectively. Many of the key factors affecting the quality of our agricultural resources—regulation of pesticides, farm subsidies, protection of prime agricultural land from development, farm capitalisation, genetic manipulation, corporate concentration of seed distribution and loss of diversity, and treatment of farm labour—are dealt with by separate coalitions of interests, focussing on different bills and objectives. For example, the problem of pesticide abuse and the complex question of how to wean agriculture away from chemical dependence have two largely disassociated constituencies—those trying to regulate pesticides better and those promoting alternative agriculture. These two groups would have greater success if they could combine their power by identifying commonalities.

A North-South perspective is glaring by its absence. I believe there is a vast reservoir of sympathy for addressing American impacts on the Third World, especially at the grassroots. The idea of thinking globally while acting locally has wide acceptance at the grassroots level, but many of the activist individuals who would be concerned with progressive development (as one finds in Europe) are pre-occupied by the fight against US military intervention. Thus, environmental issues generally lack strong global focus (except, notably, acid rain, which is seen as a North/North problem). Nevertheless, there are examples of this largely untapped interest:

(1) Strong grassroots response to the Rainforest Action Network's September call for nationwide demonstrations against destructive World Bank loans produced local actions in over 55 cities. At the same time, a significant mainstream protested multilateral development bank loans in Washington D.C.

(2) The continuous expression of interest in export issues by California groups working locally on pesticides shows promise, though it has been difficult to produce tangible results from that interest.

(3) The Global Tomorrow Conferences and conferences on the Fate of the Earth, which turn out 1000 participants on essentially international environmental and peace themes, clearly reveal interest in the movement.

However, this interest is difficult to translate into concrete action. For example, the nationwide coalition fighting for the reauthorisation of national pesticide legislation has not managed to integrate international pesticide issues into its key agenda (exports are dealt with by several separate pieces of legislation). And after four years of being exposed to the Pesticide Action Network's global perspective, the leaders of California's burgeoning grassroots toxics network did not mention any international issues in the solidarity declaration at this November's meeting. The statement might have included pesticide exports, labour and produce imports, and the relationship between California and Mexico, which have the largest volume of agriculturally related commerce between any two parts of the North and the South. Those of us interested in moving the 'backyard' orientation of America toward more global action face problems of organisers worldwide, compounded by a persistent US isolationism.

When I asked my colleagues about trends in the movement, I wanted to find out what shifts they saw in the ways we respond to the issues. Two trends stood out Firstly, the growing influence of the grassroots has been accompanied by the need of the movement to define and to shape the policy issues, to come up with solutions itself. The Reagan administration's hostility to environmental legislation and regulation has forced the public to take on the creative role of shaping what goes into the law. The National Coalition Against Toxic Hazards, in its efforts to put grassroots pressure on Congress, was very involved in development of Superfund language. As the government is unable or

unwilling to pass progressive laws, environmental organisations at the federal and state level are defining policy themselves. In states with the 'initiative process'—where voters petition to put referendums on the ballot—environmentalists are using this process to create public policy. The clean water initiative in California is an example. The Washington DC environmental lobby has helped shape bills ranging from clean water and pesticide regulation reauthorisations to legislation on the role of US in the World Bank. Increasingly, environmentalists are talking directly to corporations about their policies, and trying to find ways, such as local ordinances, to sidestep regulatory agencies that are unable to enforce policy.

A second trend is the growth of a new, more radical fringe of the environmental movement. Variously described as populists, new ecologists, decentralists, ecopoliticos, and bioregionalists, this fringe includes the more than 40 local Green parties and alliances across the country, 70-plus groups in the bioregional movement, and new 'direct action', loosely organised groups started by dissidents from tamer organisations. These so-called new ecologists are, in a sense, a continuation of a radical thread that winds through US environmental history. John Muir, Aldo Leopold and Rachel Carson, all argued for whole solutions, not just reform. Their current heirs are reacting in part to an undeniable professionalisation and bureaucratisation of the movement, and a deep sense that these highly established environmentalists cannot speak adequately or passionately enough for the earth. This new, and I believe vital, part of the environmental movement is a particularly American phenomenon, demanding we replace industrialism instead of reforming it in an over-industrialised society. Yet it strikes me that they have something in common with many Third World activists I know. In both worlds there are people and groups who envision taking control of their own resources, solving assualts on the natural world by seeking thoroughgoing social and political changes, not just reform. Both groups correctly note that often reform called for by liberal professionals fails on its own terms, whether it is the continued loss of wilderness in the US after a compromised wilderness bill is passed, or the extension of deforestation in Indonesia after an infusion of well-intentioned foreign capital.

Two final, related trends are worth noting. One is the decline of an active, effective, informative media in the US. Progressive journalists find increasing difficulty in placing important environmental stories in the major media, caused at least in part by the consolidation of a number of outlets under more conservative ownership. Particularly in television, there is growing resistance to upsetting, investigative journalism. This is occurring at a time when crackdowns on freedom of information are also occurring in other parts of the world, such as Malaysia.

Secondly, American environmentalists must find creative ways to reach their own people. One friend suggested that the problem of how to reach people in a society dominated by television is probably as difficult as in a preliterate society, since means and popular selection of communications is, in effect, so limited. Most US environmental groups are deeply involved in trying to understand how to overcome the US media and its reluctance to inform us. From new media departments in established organisations to increasingly visible actions in the name of the environment, most of the movement is groping for a way to reach and hold American opinion. I do hope we succeed.

# Lobbying for change

THOMAS STOEL

This report describes the environmental situation in the United States and non-governmental and governmental responses. It is necessarily incomplete—there are more than 10,000 US environmental NGOs. Because of the author's location and background, the report overemphasises the role of national environmental NGOs.

The United States is a highly industralised nation with a Gross National Product of more than $3 trillion, some 28 per cent of the world's total GNP. Economic growth slowed during the 1970s, but appears likely to continue at a rate of 2 to 3 per cent per year.

Most of the recent economic growth has been in services, not manufacturing or agriculture. This trend is likely to continue, for the United States is moving rapidly towards a so-called information economy. More than 60 per cent of all employment is in some form of information processing, and almost all new jobs in the last decade were of this kind. Energy consumption is increasing by less than 10 per cent per year.

The US economy recently has become much more dependent on international trade. More than 40 per cent of US exports go to developing nations, and over 45 per cent of imports come from them.

The recent political situation has been dominated by the election and reelection of President Ronald Reagan, a right wing conservative, and Reagan's efforts to change national policies to reflect his brand of conservatism. But even though President Reagan has been elected twice by large margins, the US House of Representatives remains firmly in the hands of the Democrats.

Unemployment is high by historic standards : over 7 per cent of the workforce. The unemployment rate for black people is more than twice that for whites; for black teenagers it is over 40 per cent. There is fear that growing automation will lead to a higher 'permanent' rate of unemployment.

The number of US citizens in poverty has increased since 1980. The Reagan administration has proposed reductions in governmental programmes which help the poor, some of which the Congress has permitted.

A huge US trade deficit in manufacturing has caused overall trade deficits of more than $100 billion annually, despite large trade surpluses in agriculture. There are strong political pressures to erect trade barriers, notably quotas on manufactured goods, in order to protect US manufacturing markets and jobs. Recent targets include steel imports from Latin America and textiles from Asia.

US defence spending has almost doubled since President Reagan came to power in 1980. A number of new weapons systems have been deployed or proposed, including the MX missile and Star Wars anti-missile defences.

Reagan's policies have greatly increased the US federal budget deficit. There is enormous political pressure to reduce this deficit by cutting federal spending.

In the environmental arena, progress has been made in controlling air and water pollution, though many parts of the country remain out of compliance with national standards. Major unsolved problems include acid rain and contamination of groundwater due to pesticides and other toxic substances. Acid rain threatens forests, lakes, and rivers and a significant proportion of US groundwater is already contaminated by toxic chemicals.

No new nuclear plants have been proposed since the late 1970s, so there is relatively little controversy about them. However, disposal of radioactive wastes continues to be an issue. Forestry issues include use of pesticides in forests and overharvesting of timber in the national forests.

The Reagan administration has failed to enforce laws regulating toxic wastes, insists that more research is needed before tackling acid rain, has continued to promote nuclear power, has vacillated on stratospheric ozone depletion, and has proposed to reduce other environmental protection efforts. Opinion polls consistently indicate that the US public disagrees with these

Reagan policies, and would be willing to pay more if necessary to solve environmental problems. Accordingly, the Congress has refused to go along with many of the administration's proposals. Nevertheless, budget cuts and administrative actions have taken their toll.

National NGOs concerned about the environment and the welfare of racial minorities and the poor have worked to defeat proposals by the Reagan administration. They usually have been successful in preventing congressional enactment of new laws sought by the administration. However, the administration has accomplished many of its aims through budget cuts, and through administrative actions not requiring congressional approval.

Some NGOs were carrying out programmes funded by the Federal Government. These funds were cut off, and these NGOs have had to restructure their activities.

Environmental NGOs have enjoyed increased public support due to the administration's attacks on environmental protection. The memberships of major environmental groups have increased dramatically. Environmentalists generally feel that they have beaten back the administration's attempts to make fundamental changes in environment.

Despite the administration's attitudes, US NGOs are pressing the Congress to enact a new law requiring substantial reductions in emissions from power plants to prevent acid rain. These efforts are coordinated with those of Canadian groups. US NGOs recently obtained legislation denying federal price supports and subsidies for crops grown on highly erodible lands. They are lobbying for better enforcement of laws regulating pollution and hazardous wastes.

Environmental NGOs have become more concerned about the future of the US economy. In the summer of 1984, six major groups issued a report entitled *America's Economic Future: Environmentalists Broaden the Industrial Policy Debate*. The report sets forth five basic goals:

(1) A sustainable global economy which meets the basic needs of all people;

(2) a healthy US economy which increases the quality of life for all;

(3) a healthy, clean environment and sustainable use of natural resources;

(4) a satisfying job for every American who wants one; and,

(5) widespread participation in economic and political decisions.

The report recommends actions to achieve these goals. It was attacked by US labour unions because it calls on the United States to import manufactured goods from developing nations.

Many US NGOs have become more active at the state and local levels, in view of the discouraging political climate at the national level. The economic recession of the early 1980s has hampered these efforts, but there have been important gains.

The US economy has major impacts on the rest of the world. The United States emits huge quantities of atmospheric pollutants, such as carbon dioxide and chlorofluorocarbons or CFCs (the United States has banned aerosol uses of CFCs, but other uses are increasing rapidly), which have global effects. The United States imports large amounts of raw materials and manufactured goods, accounts for a large proportion of the world's net grain exports, and exports large amounts of chemicals and other products. The huge US budget deficit has caused a rise in worldwide interest rates and the exchange rate for the dollar, exacerbating the debt burdens of developing nations.

US political and military policies also have major impacts abroad. In addition to debates about the level of the US defence budget, there are major controversies about US policies in Central America, the Philippines, and Southern Africa.

The bilateral development assistance programme of the United States is the largest in the world. The United States accounts for 19.5 per cent of all contributions to the World Bank, the largest share of any nation. Nevertheless, US foreign aid totals only 0.24 per cent of GNP, and the only substantial increase in recent years was in food aid to Africa. The last year has seen approximately a 15 per cent overall cut, as a result of the pressure to balance the US federal budget by reducing federal spending.

The US Agency for International Development (USAID) has been a leader among development aid agencies with respect to both population and environmental and natural resource problems. USAID's population programme is second in size only to that of the UN Fund for Population Activities (UNFPA). USAID is the first, and so far the only, development aid agency to require assessment of environmental impacts before undertaking activities with potential environmental effects. USAID

funding for projects to protect the environment or the natural resource base has increased more than tenfold since 1978, to more than $100 million per year. These projects include support for a number of developing country NGOs.

The Reagan administration has favoured bilateral over multilateral aid, and in 1984 was the only major World Bank donor to object to a proposed increase in funding for the International Development Association (IDA), the World Bank's soft loan window for the poorest nations. Because the United States is by far the largest donor, the increase was defeated. IDA comes up for refunding in 1987. While the administration's attitude seems more favourable, continuing pressures to balance the federal budget make it questionable whether the Congress will vote an increase.

On the other hand, the US Treasury Department announced in the fall of 1984 its support for sweeping recommendations, generated by the Congress, to guide the US Executive Directors of the multilateral development banks concerning policies, programmes, and projects of the banks which affect the environment or natural resources. Among other things, the United States is recommending that the banks increase substantially the number of staff members with relevant expertise; consult developing country NGOs in designing and implementing projects; and utilise technologies which ensure that development is sustainable.

The US Board Members of the World Bank have voted against proposed loans on the ground that the projects to be funded are environmentally unsound. US NGOs currently are campaigning against other World Bank projects, including the Narmada Project in India.

The Reagan administration has had a negative influence in a number of other areas. The administration proposed to cut drastically the US contribution to the UN Environment Programme (UNEP), which amounts to 25 per cent of UNEP's total budget, but the bulk of the contribution to UNEP has been maintained by the Congress. The United States refused to sign the Law of the Sea Treaty. It obstructed efforts by the Organisation for Economic Cooperation and Development (OECD) to harmonise international regulation of toxic chemicals and to coordinate work on other environmental issues. For several years, it opposed a strong international convention to prevent ozone depletion from chlorofluorocarbons, even though the

United States already had taken the regulatory actions the convention would have required.

The administration cast the only vote in the UN General Assembly against the UN Charter for Nature, and the only vote against a UN list of banned chemicals. It drastically reduced funding for the US Man and the Biosphere Programme, and withdrew all US financial support for the World Heritage Trust. It tried to weaken the rules under the Convention on International Trade in Endangered Species.

In 1984, the United States withdrew from UNESCO, alleging that it had become ineffective and politicised. There has been little opposition from the US public, which appeared to share the view that UNESCO was inefficient and dominated by hostile ideologues.

Also in 1984, at the World Population Conference in Mexico City, the administration questioned the need for family planning in developing nations and announced that the United States would provide no support for any organisation which promotes abortions. However, the Congress has appropriated more money for USAID's family planning programmes.

After the appointment of William Ruckelshaus as EPA Administrator, the United States once again supported a strong ozone depletion convention and stopped its obstructionist tactics at OECD. Some of the administration's negative proposals, such as the proposed cut in the contribution to UNEP, were blocked by the Congress. Other administration efforts were derailed by adverse publicity. Nevertheless, the administration's negative actions had considerable impact.

### NGO actions

Many US NGOs are lobbying for changes in US policies toward developing nations. There are strong efforts to influence the Congress and public opinion concerning US actions in Central America, the Philippines, South Africa, and other nations. NGOs are also calling attention to human rights violations.

A number of US NGOs are directly active in promoting sustainable development. USAID provides over $80 million annually for development projects carried out by US NGOs in many nations. These NGOs include church-related organisations and others such as CARE.

US NGOs are leaders in increasing the availability of family planning services. They carry out activities abroad and lobby the

US Congress to maintain government support for USAID and UNFPA. They are urging the Congress to reverse the administration policies announced in Mexico City.

There has been growing NGO activity in response to the administration's massive defence build up. Many NGOs oppose the development of the MX missile and Star Wars antimissile defences which would involve the militarisation of outer space. US NGOs have established contacts with Soviet citizens who share their concern about nuclear war.

Late in 1983, environmental and scientific NGOs sponsored a major scientific conference to announce research findings which indicate that a major nuclear war would inject huge amounts of soot into the upper atmosphere, causing a 'nuclear winter' with prolonged freezing temperatures and widespread ecological devastation all over the world. These 'nuclear winter' findings—based on research by scientists from the Soviet Union and other nations, as well as the United States—have been widely publicised. Environmental and arms control NGOs are urging that they be closely examined by Congress and the administration, in the hope that they will lead to a reassessment of the huge US nuclear weapons arsenal. Unfortunately, this does not seem to be happening.

US environmental groups have lobbied Congress and the administration, and have educated the US public on a wide variety of international environmental issues. Among other things, they have been instrumental in causing USAID to become an environmental leader; in stimulating congressional concern about the environmental performance of the multilateral development banks, leading to the congressional recommendations and administration position described above; in maintaining the US contribution to the UN Environment Programme; in pressing for sound policies relating to the oceans and Antarctica; and, in influencing US policies on a variety of wildlife related issues.

There is increasing NGO concern about threats to the global climate and the stratospheric ozone layer, due to the buildup in the atmosphere of carbon dioxide and other 'trace gases', including chlorofluorocarbons. Recent scientific findings have heightened this concern. US NGOs are lobbying for increased domestic regulation of chlorofluorocarbons, a strong US position in current international negotiations on ozone depletion, and development of an action plan to prevent warming of the global atmosphere. They are looking for NGO allies abroad.

US environmental NGOs are also active in efforts to define the nature of sustainable development. During the first half of 1986, they took the lead in preparing and submitting to the World Commission on Environment and Development a paper entitled *Sustainable Development and How to Achieve it*. They hope this document will promote discussion among NGOs from all over the world.

The appearance in 1980 of the *Global 2000 Report* and increased NGO concern about international environment, resource, and population problems prompted the formation in 1981 of the Global Tomorrow Coalition. The coalition consists of almost 100 US non-governmental organisations, including almost all the country's major environmental and population groups, as well as individuals.

One coalition priority is to lobby for changes in US laws which will make the government a strong, consistent supporter of sustainable development. A package of legislative proposals will again be submitted to the US Congress when it meets in January 1987. A second priority is to hold major conferences in various regions to inform the public about the US role in sustainable development and build support for needed changes in policies.

The Global Tomorrow Coalition has succeeded in bringing together US population and NGOs. There is also increasing cooperation between these NGOs and NGOs involved with other aspects of development. Even more cooperation is converging around the theme of sustainable development.

Many NGOs are members of the Environment Liaison Centre. A number of them participated in the ELC-sponsored Global Meeting of NGOs in Nairobi in 1985. US NGOs are also active in the Pesticide Action Network-International and the International Union for Conservation of Nature. Many NGOs have developed working relationships with counterparts elsewhere in the world, especially in Europe and Latin America. A current priority is to cooperate with NGOs in World Bank donor nations to influence Bank priorities via the Bank's Board of Directors, and to work with NGOs in developing nations to influence specific projects undertaken by the Bank and other aid agencies.

# European environmental movement: Growing global perspectives

RICHARD SANDBROOK

This essay is divided into two unequal parts :

- the environmental movement within Europe for Europeans; and,
- the environmental movement within Europe for non-Europeans.

But right at the start, let me try to capture some attitudes involved. The environmental movement in Britian and most of Europe started as a middle-class concern based around aesthetic values, and strict conservation issues, conserving plants and animals almost for their own sake.

This was generally an apolitical movement, involving kings and queens, the aristocracy and the well-to-do and those of the working class who fished or walked for pleasure. It grew out of a culture of 'hunting, shooting and fishing' combined with a culture that revered natural beauty. But gradually that movement has changed, starting in the late 1960s. Now, it has become a movement concerned with conflicts; a political movement overall. The conflicts lie between the interests of the powerful state and the private industrial and agricultural sectors on the one hand and the ordinary citizen and their environment on the other. This is, of course, a simplification but basically an honest one.

The conflicts are between short run economic gains versus long run environmental costs; between private gain and common good; and, inevitably between Left and Right in political terms. Many environmental issues are not only about environmental risks or impacts but also about power by whom, for whom and how.

In the early 1970s the 'alternative movement' began. In effect there are really three movements: the strictly conservation movement, the radical or political change movement, and the alternative movement which seeks a completely new approach to natural resource use and to lifestyles. On occasion they act alone and on occasion in unity.

Within Europe the points of conflict have progressed from very specific and local affairs to debates that often question the very basis of European industrial and agricultural existence. The German Greens and the liberal ecologists are in the vanguard of such radicalisation. But they hold political power only in certain, very particular circumstances brought about by proportional representation. Even then the parties are coalitions of 'conservation per se', 'conflicts by issues' (such as nuclear power) and 'alternative lifestyles' groupings. Without the broad appeal, they lack sufficient vote winning pull.

Some Europeans see limits to industrial growth and resource use and their activities get more and more radical compared to the norm—organic agriculture, alternative economics, inner city renewal and small scale 'green' enterprises. But whilst their influence is growing in patches it is not yet an election winning movement nor will it be for many years to come.

In 1970 the concern of the mass of the public was primarily with pollution—with the problems of the affluent society—and in the mid-seventies with energy, and particularly nuclear energy. This issue focus drew many to environmental campaigns and awareness. Then in the early 1980s environmentalists started their attack on modern agriculture and the common agricultural policy. Again this was a peculiar coalition between the right and the left. The change that is argued for is the removal of agricultural subsidy (a market or right wing solution). But the left, looking for a more equitable world agriculture model, lower consumer prices, and a protected environment also support the removal of subsidy. In effect common political targets but for entirely different reasons.

Now in the mid-80s a new focus is the impact of the rich world's consumption and wealth upon the poor world's environmental destiny, particularly in respect of Africa and on forest lands. Again it is an odd coalition between the Quaker-driven Oxfam ('Leftish') and the World Wildlife Fund ('Rightish'). It is easy to say that there are some guiding ideas behind the concern but that is probably overstating the case. Europe's environmentalists are a mixed bag—a set of marriages of convenience.

However, I look to a new consensus that is now awakening. Throughout, the genuine belief of a few has been centered upon:

- equity issues—who owns and controls what;
- on technology issues—what, in terms of the future, is appropriate (nuclear power or energy saving);
- on decentralisation and participation—the power of communitites to determine their own futures; and,
- on biological sustainability and resilience—how far can we amend nature to serve our own economic ends?

While many have been motivated by 'not in my backyard' (NIMBY) approaches, or by a genuine desire to see Nature conserved, the North/South issue is beginning to take hold. In this area people and livelihoods are the focus.

Of course, the very word environment has become a fashion—it is used by heating engineers (environmental engineers), architects, bankers, and politicians of Left and Right. But the radical movement that holds to the principles above is now growing again. This is after a long pause since the early 70s when a relatively small group of people, say 200 to 300 in Europe as a whole, have kept the issues alive.

So much for the roots of the movement. How have campaigns—the activist agenda—been conducted, be it against nuclear power, a new airport, pollution or open cast mines? The methods have tended to be the same and are no doubt familiar. The first requirement is to mobilise support. There are four components:

- Public awareness and information—often made available by way of demonstration or an event to bring the press and TV into the game. Hopefully this leads on to political action by the many and not just the few.
- Research—the environmental movement has mobilised its own scientists (social, natural and lately economic) to question the major issues such as the risks of nuclear power, the long term impact of lead pollution, the actual state of fisheries and other renewable stocks, the condition of soils, the water table, etc. Like the citizens' report on the State of India's Environment, much of this amounts to synthesis research or science

journalism—all important for any radical reform.

- Organisation—a vital component to mobilise mass movements of support so as to impact on politicians, on companies, and on authorities in general.
- The Law—either by way of the novel use of existing laws or by way of new legislation hard won through parliament or local government.

### The issues

Some of the current issues in Europe are:

- climate change and acid rain;
- nuclear power and nuclear waste;
- the pollution of water—not now by industry so much as by agriculture (nitrates/pesticides);
- overproduction of agricultural goods leading to habitat destruction;
- health (food additives, asbestos, lead in petrol);
- transport—massive new road schemes and the power of the motor lobby; and, increasingly
- the impact of European aid on Third World environments.

### The future

The great challenges we face are, in their own way, daunting. The pollution battle is largely won, the land use argument just beginning, education and awareness well along. But these are not the real issues set out in the principles above. How do we reschool society (or deschool society) to consume less and de-industrialise ? Undoing consumption and the environmental impact it causes is very much more difficult than regulating it in the first place.

And that is the problem. The resource use by the North, in international terms, is quite unsustainable if international equity is to follow. The South, to really develop sustainably, rightly demands a different set of North-South arrangements. But I see few signs of those occurring. This is because our society—whilst tidying up the worst examples of environmental abuse and righting local inequities (at times)—rarely, if ever, sees the connections North to South in environmental or equity terms.

Our debt burden on Africa is not counted in when game parks lose their rhino. The pressure on land—for export crops or

domestic food—'is not the result of *our* policies, in any part', so it seems. Poverty only hits the news when millions die. Grinding or chronic poverty is not a concern of consumer man. It is for this reason—the sheer size of the challenges we face—that North-South solidarity in environmental campaigning is a must now and in the future. Without it nothing will change.

**Agarwal:** I would like to ask a question. But let me begin on a lighter note. I know someone who believes that most environmental concerns can actually make excellent Hindi movies. Here is one example that he gives. A Hindi movie always has an *indomitable* hero fighting against social injustice. Take three leading Indian film stars, Amitabh Bachhan, Shashi Kapoor and Dharmendra, somewhat similar to Marlon Brando, Steve McQueen and Clint Eastwood.

Imagine one of them lives in a small fishing village where the fisheries are being killed off because of the pollution from a factory. The other lives in a village near a forest which is being steadily cleaned up by a forest contractor and a gang of timber smugglers closely linked with local politicians—agriculture in the village has been badly affected and soil erosion is increasing. The third actor comes from a village which is about to be submerged by a dam.

Because of their problems, these three people migrate to the town as many villagers do. In the town, they come to live in dirty slums. Here they not only meet but as they begin work in factories, they learn to form trade unions and fight on an organised basis. Of course, as always, they all meet nice heroines. They all talk about their problems, begin to understand a little bit of the truth about why they had to come to the city, what was causing the changes back home leading to their loss of livelihood, and they decide to go back.

They work together to take on their "enemies" one by one. All the three first organise the people to stop the pollution from the factory destroying fisheries. Next they go and get rid of the forest contractor and timber smugglers. Maybe, at this stage, we can see Shabana Azmi, sister of Amitabh Bachhan, carrying a headload of firewood. She gets very angry with the village men who are just not interested in planting trees on the surrounding wasteland. She forms a *Mahila Mangal Dal* to plant trees so that the fuel and fodder problems of the women are solved. In this way, the film also gives us a message about the need for women to organise themselves and assert their interests in community matters. The local *sarpanch* is shown as another villain who wants to break up the newly formed women's group.

Of course, they all then go and stop the dam. Finally, everybody lives happily ever after and the movie can end with all the couples singing a song running round and round a tree, as all Hindi movies do.

But on a more serious note, let me say that the biggest motivating factor for many of the environmentalists in India, is really the desire to oppose social injustice.

I wonder what is the motivating factor for the environmental movement in the North? I see very militant, dynamic and angry people in Germany and elsewhere, but still they all come from a very affluent background. What is really motivating them to ask for social change? I have lived in the West and have interacted with a lot of people there. But I still do not think I really understand the forces motivating them to demand change. Would anyone like to comment?

**Stoel:** In the environmental movement in the US, there was real outrage about pollution, the very kind of thing we heard about in India. Many bad things were happening to our natural resources, people were dying and no one had noticed.

**Sandbrook:** I can think of three motivating factors in the North. One was the concern for aesthetic values: an intangible value system, which was tied up with a romantic view and had undertones of religion. Secondly, social injustice was an underlying concern in the North, too. Thirdly,there was always a perception of global equity. For instance, we in the North may get very alarmed if 100,000 people die of theChernobylaccident, but that many die of waterborne diseases every year in the countries of the South.

**Ui:** In Japan, environment used to be a lower middle class concern, but it is now changing.

**Adams:** Environment issues in the North are also life-and-death concerns. Fear is a major motivating factor because, one, people are living with time bombs (cancer, for instance) and are fearful because they do not know for sure what to do about it; and, two, there is the fear of someone creating an unacceptable risk for someone else.

**Chatfield:** There is an outrage in the US about the way power is exercised by corporations and governments. The military machine wields awesome power—about 40 per cent of the US military budget is spent for intervention in the Third World.

**D'Monte:** Perhaps a difference between Northern and Southern environmental concerns is that marginalised groups, which are at the forefront of concern in India, are absent in the west. For instance, I cannot think of blacks or American Indians being involved in America's environmental movement.

**Chatfield:** There was a lot of concern some time ago about the forced removal of 10,000 Hopi Indians from Arizona. Environmentalists in the US are concerned about these issues.

**Stoel:** The military-industrial complex has got a life of its own. It is steering our country in directions that make no sense to the interests of people in the US. I am not sure that rationally this $300 billion that we spend on the military makes any sense at all.

**Chatfield:** As much as US$100 million is the net inflow to the US from the Third world in terms of world trade. We are spending that much simply on theory on research for our military machine.

**Saint:** I feel that environment concerns in our country and in Europe, America and Japan are not different. If anything, the environment movement in the west and Japan is better organised, has a deeper understanding, and is strategically better planned. The way I understand it, the present expression of environment concerns in India is a subset of the global environmental concern. I think there is a dimension of the Indian environmental concern which has tremendous potential but it has still to come into its own. It is still to be touched and realised, we are reaching for it, but it is not articulated. The history of contemporary environmental concern in this country ignores the ancient cultural values, including the living values of the indigenous tribal community. We still have to understand that the cultural context of current environmental concern has to be seen both in terms of the great traditions as well as the little traditions, all over the country. I think that research still has to be done to recover that knowledge which deals with the relationship of attitudes and practices to ecosystems.

**Ui:** I agree about the deep meaning of environment. In different societies, surprisingly, we have some similar components or similar tendencies. But despite the common basis of the environmental movement, I observed the influence of traditional value-systems in each country, surely in India, there is the influence of Gandhism as well as the history of India. The Japanese environmental movement has some roots in our traditional society. In Latin America, we have a different history and different styles. But the common interest is quite the same. As we say in Japan: there are many routes to climb Mt. Fuji.

**Agarwal:** Stoel mentioned a 'sense of outrage' as one of the important factors which started off the environmental movement and then Pat mentioned 'fear'. To the extent that I understand the situation, both Pat and Stoel are basically talking about the motivations of a very large number of middle class people in Northern societies. These are people who are beneficiaries of the system and yet there is a strong sense of outrage and fear. If we take the Indian middle class, we will not see any outrage or sense of fear. It is literally aping the same developmental processes we have in the North. In fact, there is a tremendous sense of 'need' and a tremendous fascination for the same development. It would be interesting to find out how this sense of outrage and fear was so successfully created in the North. Pollution may create a sense of fear in Canada but I do not see much sense of fear of pollution in a city like Delhi, even though it is far more polluted than Toronto. Strong environmental action in this country is really from people who are facing threats of survival.

**Ui:** Until 1970, that is the challenge we faced. We had quite a similar situation in Tokyo. Until May 1970, when we had photochemical smog which hit the middle class, pollution only affected poor people in remote Minamata. The middle class in Tokyo said, "Oh, we are lucky we are not poor so as to be hit by industrial pollution." This sentiment was commonly felt in Tokyo. Overnight all this changed because of photochemical smog. It hit the middle class in the residential areas of Tokyo. Suddenly, all the mass media woke up and pollution became a national issue: I cannot predict the future, but I think people in Japan have understood the situation. We must be prepared for sudden change. We were not so well prepared in 1970 so the political situation did not change much.

**Adams:** I do not know if it alters Anil's argument, but I do not think environment is a middle class phenomenon now in the North. In Canada, everybody is concerned about it.

**Sandbrook:** Not even the activists are middle class any more. In Europe, if anything, it is more of a working class movement. Moreover, the linkage has been quite clearly made between the situation in Africa and environmental degradation. It is now

very widely understood. Without question there has been much unification of the environment and development concern in Europe. I do not mean development in the sense that a developer does, but in the sense of North-South equity. That is now becoming an increasing motivation behind the movement. We see this because all environmental movements are moving into international issues like Africa and a lot of the development organisations are strongly moving into natural resource issues.

**Kocherry:** Though I agree with Anil that in the Indian situation, environment is a social justice issue, there could be other motivating factors also. In the North there could be aesthetic factors or the experience of previous wars. They do not want to go through the same tragedy again. So they need not have a movement only against an exploitative structure. But what links us all is the international exploitation that is affecting us, which is not coming through in our environmental concerns. Who is really imposing all these things on us? The international exploitative structure should provide all the motivation for us to come together, if it is a social justice issue.

**Pande:** I would like to share some perceptions of my recent US visit. I was there for a month and for some 15 days in Britain. I had gone there after the Bhopal tragedy as part of a delegation of trade unionists. I was meeting various environmental groups, trade unions and action groups and explaining to them what really happened in Bhopal. In the process, we were trying to understand how they were organising their health and safety issues.

We realised that 10 to 20 years ago, there was something like the typical American dream and the dream was that if anyone worked hard, was very sincere and dedicated to his job, he or she could achieve the dream of owning a house, car, air conditioner, hi-fi system and things like that. Now more and more people realise that however hard they may work, they are not going to realise this dream.

The second impression was that most of us in the Third World are poor people. It is the kind of impression we get in India about Americans, Canadians or Europeans—whenever we see them in a hotel or at a meeting, they are always drinking mineral water. But after going there we realised that it was one thing to be poor in a poor country and that is painful but it is much more painful to be a poor man in a rich country.

The third thing became very evident after Bhopal. We had this feeling that multinational companies do callous things to the working class of the Third World, but they were at least more considerate to people in their own countries. Going there, visiting factories and communities, meeting workers and employees, we realised that they are as callous to their own people as they are to the Third World.

The kind of things which happened in Bhopal had a dramatic effect globally. When we started researching Union Carbide's history, we found that there was a definite pattern in these disasters and accidents. There was nothing very typical about Bhopal. Similar things have been happening in other parts of the world also, including the First World.

At the risk of digressing a bit, I would like to state that the entire economy at the world level is in crisis. Capitalism, in order to resolve its crisis, is trying to create a different kind of international order and I think that this order is going to affect First World people as much as the Third World. This world crisis affects countries and societies across the world, across the socio-political structure. The possibility of limiting this crisis to the boundary of a country or one socio-economic structure is very small. This crisis is not going to end spontaneously. The crisis is not only economic, it also affects the environment. It is building up a different kind of militarisation at different levels in different parts of the world; it is affecting basic survival.

I can narrate an instance of a town known as Oxford in the US,where we were going to meet trade unionists from the garment and clothing industries. There were some 40 dedicated activists, and when we were introduced, they were slightly antagonistic towards us. They felt we Third World people were taking away their jobs. It is a fact that during the last five years, more than 500,000 people in the US have lost their jobs to Third World workers from India, Pakistan, Bangladesh, Sri Lanka, Taiwan, Singapore and Hongkong. They felt that because we provide cheap labour, because our governments are very much more supportive, that is why they were losing their jobs. We saw them wearing shirts with the slogan: "Be American, Buy American". We saw picket lines before departmental stores in America. They would not allow any garment from the Third World into those stores. There was a very interesting incident in one such store, I bought a shirt and when I came back to my motel, I saw that it was made in India. When we were talking, I told them that it was not a question of having an antagonistic

position against Third World people. We have to think about this problem a bit more seriously.

**Anupam Misra:** The important thing to realise today is that we really do not need new strategies because they are not going to work. What we really need is a new concept. What do we really mean by development and what kind of development do we want? Whether we like it or not, this kind of development that took place in First World countries over the last 100 to 200 years was mainly based on the exploitation of the Third World. That kind of development is being projected as a model for the Third World. We cannot adopt that kind of model now because those resources are not available. It will not work also because more and more colonies are being lost. There should be a joint venture to identify a new kind of development for the North and South, working together.

Ultimately, the environmental issue is cultural. One culture is projected as better than the other. The fact is that there are two cultures in the world today: one which is running to save itself and the other culture which is trying to capture and strangle the first culture. Sometimes what happens is that the prey which is running gets tired and then decides to rebel against the running and starts a movement. Sometimes the hunter also gets tired running, or at least some among them, and want to start a movement asking, "What is the point of all this running?" It is true that both are getting tired, but one still has the arrogance of victory and the other has the humiliation of defeat.

# Making afforestation a people's programme

DR. KAMLA CHOWDHRY

The National Wastelands Development Board (NWDB) was established in 1985 as a response to the extensive deforestation that is taking place in the country. The satellite imagery had given us concrete data for the first time in 1984 as to what had happened over the decade of the 1970s. This data had come as a great shock to the nation and especially to the people deeply involved with environmental issues. The Prime Minister, too, was very concerned about this particular fact.

Many people for a long time had been saying that India is losing its forests very fast but clear-cut scientific evidence significantly deepened this concern. This was a very important element in the consciousness-raising that took place, which finally pushed the government to take action.

The government became very concerned not only with the extent of deforestation but also the rate at which it was taking place. The satellite data showed that India had been losing its forest cover at the rate of 1.5 million hectares (mha) a year during the 1970s. The fact that the loss of tree cover exacerbated poverty, was another major reason which pushed the government to act.

The Advisory Board on Energy had recommended in 1983 to the Prime Minister, Mrs Indira Gandhi, that fuelwood should be made a part of the Minimum Needs Programme. The government has a 20-point programme and within that minimum needs like drinking water are included. The Board had recommended that fuelwood too should be included as a minimum need. Mrs Gandhi accepted this recommendation. Experts told us that there is a big gap between the demand and supply of fuelwood. Firewood is always in short supply and this shortage would grow.

The Prime Minister, Mr. Rajiv Gandhi, therefore, announced in January 1985 that we must put a halt to deforestation. By establishing the National Wastelands Development Board, he wanted 5 mha of forests to be planted every year to maintain the ecological balance. If deforestation is to proceed at the rate of 1.5 mha a year, by the year 2000 there will be no forest left at all. And it is absolutely clear that if we need today a massive afforestation programme to meet the needs of the people, this can only be done by a people's movement, which is one of the directives given to the new board.

The target of 5 mha of afforestation a year has not yet been attained, but the direction towards making it a people's movement is more significant. Going on the right road is more important and, therefore, the efforts in the last one year and a half have really been to see how to make this programme a people's programme, how to involve agencies which are closer to people, and how to shift the programme of afforestation towards social forestry.

Major afforestation programmes today are almost entirely implemented by the forest departments on forest land. We felt it is important to reduce this effort over a period of time to 50 per cent of the total afforestation effort and involve people more. Therefore, we were clearly looking for radical departures from the existing policies of the government. Until recently, the government would identify the land, do the planning, water the plants and hope that in four or five years it could transfer the afforested area to the people, who would then manage it.

There are many things in life which we only learn after experience. To my mind, of the various directives that we received from the Prime Minister in his announcement to the nation in January 1985, the involvement of the people was much more significant than meeting the 5 mha target. Once we start moving fast in the right direction, the momentum so gained will be quite fast in reaching the annual target of 5 mha.

In order to make afforestation a massive people's programme, the board acts as a nodal agency. Afforestation and the growing of trees and grasses are functions performed not just by the forest departments. There are a number of programmes within several ministries and departments which are related to afforestation, and which require to take an integrated view.

Afforestation is important in river valley projects under the Ministry of Irrigation, in soil conservation programmes for the Ministry of Agriculture, in employment generation programmes under the Ministry of Rural Development, and also in drought-prone area programmes. There is a need to have a certain degree of self-consistent policies.

In the Integrated Rural Development Programme (IRDP), which is one of the most important anti-poverty programmes, 40 per cent of the funds have been used for cattle distribution to the poor. There is experience to show that the fodder shortage in the country is very acute. In a few states, the shortages are anywhere between 50 to 80 per cent. The very poor who do not have land hardly benefit from this programme. The programme was a success generally where good fodder resources existed. Otherwise, the programme had not done well. Therefore, when cattle are being distributed, care must be taken to see that in that area, there are schemes to grow fodder on community lands. This would be an example of an integrated approach. Doing any co-ordination in government is very difficult. There are very strong territorial imperatives and it is very difficult to sit down together. Self-consistent policies are always fragile things.

**Overgrazing, a prime cause of wastelands.** NWDB

When we began to look at the issues which are important for involving people, it meant looking at the whole question of land and especially ownership of land. Now, land again is a subject which is dealt with in parts—agricultural land is managed, and related policies determined, by the Ministry of Agriculture; policies regarding forest land are determined by the forest departments; revenue land policies are determined by the revenue departments; community land use and policies are determined by the panchayats or representatives of village groups; and, then there are urban development policies in heavily populated places. We have very conflicting policies on the use of land, especially of common land, and therefore, it is necessary that decisions are taken at the very highest political levels on how the country is going to use its very scarce land resources. If we do not really get a sustainable use of land, we will keep on degrading our land resources, as we have done in the last 40 years. Not only have we degraded our forest areas from 75 mha to about 35 to 40 mha—in other words, half of our forest area is today degraded—but at the same time all the common lands and revenue lands that we had largely used for grazing, have become very degraded, both because the human population and the number of cattle have increased enormously. The fact is that after independence, the government has been distributing community lands in connection with the anti-poverty programme, to the rural poor. Besides that, stronger people in villages have illegally occupied many of these lands. The net result has been that over the last 20 to 30 years, land available for grazing has been halved and the remaining grazing lands badly degraded.

Also, the way we have built bad roads has done a lot to degrade land. We have not built supporting systems to afforest and stabilise the roads. There is documentary evidence of a great deal of damage done to hillsides by the kind of technology that we have used in road building and for their maintenance. Similarly, a great deal of waterlogging has taken place with irrigation canals, and, as a result, a great deal of good agricultural land has become alkaline and saline.

From the few broad estimates that we have, we can say that there are around 175 mha of degraded land at present—about half the total land mass of the country. Unless immediate action is taken on the land use pattern, land degradation is bound to increase very fast. I am told that there is no soil left on many hills.

When we look at the acreage under saline and alkaline lands, the increase from the 1950s to the 1970s is almost 100 per cent. Again, from the available data, salinity and alkalinity threaten to increase another 50 per cent. Therefore, if we are not able to reclaim the land, make it more productive and use it in a sustainable way, we will be losing yet more land. It is terribly important that there are mechanisms to decide how land will be used in a sustainable way.

When the NWDB was established, it had recommended a two-tiered structure. One is the NWDB and the other is the National Land-Use Board under the Ministry of Agriculture. Both report to a new entity called the National Land-Use and Wasteland Development Council, which the Prime Minister chairs and which consists of Chief Ministers of various states. It is a very high-powered body to ensure that policies relating to land, water and other factors do not conflict. These conflicts relate not only to the different uses of land but also to the uses between the Centre and the states.

The issue of afforestation has moved forward in terms of the institutional structures that have been established and the identification of the major issues that need to be looked at. The fact that for the first time the government at the highest level has said that afforestation must be a people's movement, instead of an effort of the forest department or other bureaucratic systems, has opened the doors for a major effort. At least there is less resistance to support voluntary agencies. Because this statement came from the Prime Minister, it was not rejected outright as it earlier used to be. In many places, there are now projects involving government programmes and voluntary agencies.

There are two aspects I want to emphasise. The first is that if we want to make a major departure and start a massive new programme, my experience in the development world shows that it is terribly important that there is political support from the highest quarters. It is one of the prerequisites for such a programme. India has been very fortunate to have a Prime Minister who is interested in these issues and has lent his full weight to this programme.

The second aspect is that a massive new programme cannot be undertaken in a fragmented fashion, which is how ministries

in all countries, not only in India, function. Each Ministry looks at a programme from its narrow point of view. It is necessary that there are structures which cut across ministries. But the Board requires much greater strength to do what it wants to do. Initially, when a bold idea is mooted, there is much resistance to it. A nodal agency which cuts across various ministries is a prerequisite for moving in a direction in which new things can happen.

The people are very ready for a massive afforestation programme. But there are difficulties. I used to think that once we got a voluntary agency to do all this and we have funds with which we can support them, then we can really leap forward. But I have discovered that there are problems.

If we want a people's movement in a country where we have many landless people and small and marginal farmers whose land resources are not only very minimal but also very degraded, how are we going to get them to plant trees? If the poor have a piece of land which cannot be used for agriculture but is good for planting trees, then the problem is not complicated. In fact, that is the strategy the board is following at the moment by providing technical assistance or other support through voluntary agencies to those people who want to take to agroforestry and thereby increase the tree cover. This poses little problem.

But if we really want massive afforestation, we will have to look at common lands—40 mha of forest land which is without cover, and the 40 mha to 60 mha of revenue land which is degraded. As much as 90 per cent of revenue land has either been illegally occupied or distributed. When we actually go to a block, we find there is not much revenue land available and it is full of legal hassles. Acquiring revenue land for afforestation is in general a very difficult proposition. Unless there are strong measures to ensure that the remaining lands are identified and nationalised to do away with legal hassles once and for all, it will be difficult to put them to more productive use.

The state governments are very reluctant to move in this direction. It is not only because there is so much of bad record-keeping—90 per cent of this land is illegally occupied—but also because they are not really willing to bring this kind of information out into the open. There are some states where what is called a government resolution (GR) has been passed—that the poor can get land for planting trees—but nobody in the countryside knows about it. There is resistance in moving in this direction and we have to really push even more. A much stronger political will is needed to move in this direction.

There is this problem of revenue land and in degraded forest lands where many people have expressed a desire either to co-operate with the landless or a voluntary agency to afforest patches of 100 or 1,000 ha of revenue and degraded forest lands. The land will still remain forest land but it will be handled with the provision of tree pattas. The forest departments are very reluctant to do that. The Forest Conservation Act says that forest land will not be diverted for non-forest purposes but it also says in its guidelines that even for afforestation, if the agency is any other than the forest department, permission will have to be sought from the central government. The forest department claims if it gives away this land even for afforestation purposes, how will it monitor its use? What if the allottees start to grow crops on it? Suppose they do grow trees for a number of years, the department fears that when it wants to get back the land, it may never be able to reclaim the land.

To an extent, the fears of the forest department are right. But I feel we need to make up our minds whether our policies and acts will operate on the basis of trust and involvement of the people, or are we going to say, 'No, we cannot trust people'. Both approaches are based on assumptions of human nature and with the experience of reality; voluntary agencies generally have an overwhelming leaning towards people being responsible. If people can be convinced that something is in their good or for the larger good or for the good of the next generation, they do respond. The other assumption regarding human nature that people will not respond and, therefore, we must have guards and guns and that is the only way to protect existing forests, is also partially true. But my leaning is much more on the side of trusting people. If we do not involve and trust the people, then we will lose the remaining 35 mha of forest land. We must get people to work together to afforest the degraded 40 mha. The forest departments will never be able to do it. It is an impossible task to protect this large area of 40 mha.

**Growing wastelands: 175 mha of degraded land.** NWDB

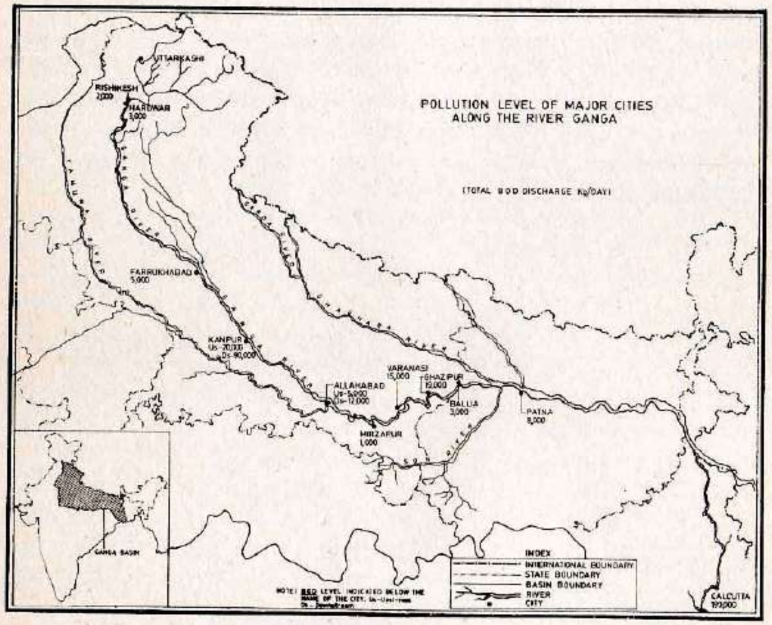
The biggest constraint that we have encountered in starting a people's movement for afforestation is the lack of access to forest and revenue land. This is a battle we need to win. It really means a re-examination of the forest policy, which is based on a colonial system. All our policies and acts which we have inherited from the past, are based on mistrusting people. We need to review them and see whether they are promoting or hindering people's participation. The Forest Conservation Act is an excellent Act to stop diverting forest land to non-forest purposes. It has done a very good job. But the guidelines for this Act need to be reviewed. There are other Acts like the Tree Cutting Act. Its intention is to prevent illegal cutting of trees in and around forest areas. In fact, even in my own private backyard I cannot cut a tree without taking several different permissions. This is a great deterrent for people to plant trees. Now if we want people to afforest their degraded land with farm forestry or agroforestry, these laws have to be modified and amended. There is also an Act about tree transportation. A small voluntary agency in Gujarat was helping poor people to grow prosopis and make charcoal. In order to transport the charcoal from their cooperative to the town, they have to spend ten to 15 days getting permission. These are only a few problems that have come to my notice. We systematically need to look at our laws to see what is the impact of these on the involvement of the people in a massive afforestation programme. This brings me to my last point—about our administrative systems at the district and block level which are very confusing and difficult. If anyone wants to lease land, get tree tenure, or funds allocated—and we have a lot of funds under our employment generation and social forestry programmes—the whole process is very difficult. The person has to go from one office to another where officers always find faults—"this form is not properly filled up, come back again". The process is not only complex but involves indignity to the human being concerned. We need to have an administration which deals with poor people with some degree of dignity.

If India's administration can have a single window for small scale industries, why do not we think of a single window for leasing land and getting funds and permissions. A person would be able to get everything done in half an hour or at the most half a day. Voluntary agencies have been helping tribals and poor rural people in all this but there are not enough voluntary agencies in this area.

A people's movement cannot be implemented by the bureaucracy. The bureaucracy, not only in our country but all poor countries, does not have a delivery system for the poor—whether it is education, credit or health. Bureaucracies are very good for certain things but not so good for others. In a country like India, where we have large cultural differences and traditions of exploitation, the bureaucratic structures are not very effective in reaching the poor and, therefore, we need to use voluntary agencies and other such alternatives. But bureaucracies can play a significant role in providing enabling systems and policies through which people can participate effectively and with dignity. The forest department has a very major role to play but the afforestation programme definitely needs to be shifted in the direction of the people.

I will mention one more thing which the board has done in the social forestry programme. The forest department used to have large nurseries not only for their own block plantations but also for distributing saplings to farmers for farm forestry. Many of these saplings were taken by the larger farmers. The poor farmers were not able to transport saplings from the central nursery. One of the policies the NWDB has tried to push through, with some degree of success, is to establish decentralised people's nurseries. We eventually want a nursery in every two or three villages. The board has asked the forest departments to identify the beneficiaries, provide them with necessary inputs in the initial years, and develop a buy-back arrangement so that the beneficiaries are not landed with unsold saplings. We want forestry to become a self-sustaining activity without having bureaucracy play a major intermediary role.

In many foreign donor-supported programmes like that of the World Bank and the Canadian International Development Agency (CIDA), there is a large element of expenditure on infrastructural support. As much as 40 per cent of the funds have gone to increase in staff, housing, office facilities and cars. Later on, the forest departments find they are not able to sustain this expenditure. It is important that from the beginning the forestry department is told that there are many things that can be done through people's organisations. Starting nurseries and collecting seeds are amongst them. One should think of the forestry department as a resource which can help people, and which can give the necessary inputs and other help, instead of becoming a major operational agency. This is the direction which the board would like to see forestry move into essentially.



# The Ganga Action Plan

K.C. SIVARAMAKRISHNAN

The Ganga drains eight states—Himachal Pradesh, Punjab, Haryana, Uttar Pradesh, Rajasthan, Madhya Pradesh, Bihar and West Bengal—and the Union Territory of Delhi. It is the most important river of India and has served as the cradle of Indian civilisation. Several major pilgrim centres have existed on its banks for centuries and millions of people come to bathe in the river during religious festivals, especially the Kumbhs of Hardwar and Allahabad. Many towns on the Ganga, for example, Kanpur, Allahabad, Patna and Calcutta, have very large populations and the river serves as the source of water supply for these towns. The Ganga is, however, being grossly polluted especially near the towns situated on its banks. Urgent steps need to be taken to prevent this pollution and restore the purity of river water.

The main sources of pollution of the Ganga are:

- Urban liquid wastes (sewage, storm drainage mixed with sewage, human, cattle and kitchen wastes carried by drains, etc.);
- Industrial liquid wastes;
- Surface runoff of cultivated lands where cultivators use chemical fertiliser, pesticides, insecticides and certain manures which when mixed with the river make it unsafe for drinking and bathing;
- Surface runoff from areas on which urban solid wastes are dumped; and,
- Surface runoff from areas on which industrial solid wastes are dumped.

The Ganga, in its 2525 km length, starting from Gangotri in the Himalaya to its meeting point with the sea at Ganga Sagar in the Bay of Bengal, passes along 29 Class I cities (population over 1,00,000), 23 Class II cities (population between 50,000 and 1,00,000), and about 48 towns having less than 50,000 population. In those towns where there is no sewerage system or the coverage is only partial, the waste water flows through open drains and finally finds its way into the river. Unfortunately, even in some of the sewered towns, a similar situation arises when pumping stations are non-functional due to lack of maintenance or non-availability of electric power.

Since the scale of pollution also depends on the degree of dilution and velocity of the flow of water, it is necessary to maintain a minimum discharge in the river, especially at critical points where urban settlements and large industrial units are located and which produce substantial quantities of obnoxious liquid wastes. Unfortunately, this is not kept in view while tapping a river for irrigation. The intensity of irrigation in the Ganga basin is very high. About 43 per cent of the total irrigated area in the country is located in the Ganga basin. Practically the entire dry weather flow is diverted to the Upper Ganga Canal at Hardwar and whatever flow is regenerated between Hardwar and Aligarh is again diverted to the Lower Ganga Canal near Aligarh. As a result of this, there is very little dry weather flow in the Ganga at Kannauj and Kanpur where there is a heavy inflow of pollutants in the river. The Ganga receives over 60 per cent of its water from Yamuna, Ghagra, Kosi and Gandak, all joining the main river at or at points below Allahabad. The Hardwar-Allahabad stretch is, therefore, particularly vulnerable.

Crowded ghats at Varanasi. K.K. CHAWLA

### Prevention of pollution

Stoppage of discharge of sewage/sullage into the river should reduce the pollution by almost 75 per cent. Fortunately, in most of the major urban settlements on the banks of the Ganga, trunk sewers have already been laid along the riverside to intercept the drains/sewers coming from the inhabited areas. Most of the dry weather discharge of sewage/sullage (which at times also contains liquid wastes of minor industrial units) can be intercepted and carried by these sewers to such downstream points where sewage can be pumped above the ground level and applied on land for cultivation. But, as mentioned earlier, often the pumping plants installed for this purpose are not properly operated and maintained, with the result that sewage overflows from the sewers and finds its way to the river. At many places, these plants have been lying out of commission for many years. The main reason generally given is the lack of funds for operating and maintaining the pumping plants. In some cases the sewer networks connecting to the treatment plant may be incomplete and in some others, connections are not adequate. In some cities, the power bills for these pumping stations are not paid for many years and the power supply agencies are compelled to disconnect the power connections. Whatever the reasons, these non-functioning treatment plants give no benefit from the investment. The problem has to be solved and it should be possible to do it in the following manner.

Sewage is a very rich source of energy (through the production of biogas) and manurial matter. Utilisation of this manurial matter can increase the crop yield substantially. On the basis of nitrogen, phosphorus, and potassium content (NPK), the per capita contribution of manurial matter can be taken as almost Rs 3 per year. As regards energy, the per capita contribution of biogas (in terms of equivalent energy from kerosene oil) can be taken as Rs 2 per year. The production of electricity from sewage will also ensure a regular supply of power to run the sewage pumping and treatment plants. Given the overall scarcity of power, the provision of energy at least for operating the treatment plant by such recycling should be a critical consideration. In some cases, some surplus power may still be available for other uses. Ways and means for an optimum use of this power can be worked out after considering the local condition at each place.

As regards the best utilisation of the rich manurial components of sewage—the digested sludge and effluent produced by the sewage treatment plants—it should be recognised that these are marketable products and the authorities should be able to arrange for their sale at reasonable rates on the basis of NPK contents. At present, raw sewage is generally allowed to be used by farmers at very low prices that have no bearing on the manurial value of sewage. The use of untreated sewage for irrigation is also inadvisable because its handling by the farmers and eating of the produce from these farms pose serious health hazards.

A non-conventional sewage treatment plant, much cheaper and more compact than the conventional plants, is quite feasible. Raw sewage is led to a settling process where solids are separated from liquid. The solids go to a digester to produce methane gas and digested solid. The methane gas is fed to a gas turbine to generate electrical power for running the factory as well as to sell the surplus to other consumers. The digested solid is sold as manure. The liquid from the settling produced and separated is to be fed to a digester. The liquid or water from the biological aerator is clean enough to be used for aquaculture where algae and fishes can be grown. Algae can be harvested as poultry feed and fish marketed. The water from aquaculture will flow out as irrigation water.

Thus, each sewage treatment plant can function as a resource recycling unit producing energy, manure, poultry feed, and a source of irrigation. Efficient marketing of these products will be an integral part of this resource recycling unit. This conceptual model is based on the treatment plant developed by the National Botanical Research Institute at Lucknow.

### Action plan

The immediate reduction of pollution load on the river (leading eventually to total prevention) and the establishment of self-sustaining treatment plants, are the two objectives of the action plan in the first phase. Accordingly, the following have been identified as components of the action plan:

- Renovation (cleaning/desilting/repairing) of existing trunk sewers and outfalls to prevent the overflow of sewage into the Ganga.
- Construction of interceptors to divert flow of sewage and other liquid wastes away from the Ganga.
- Renovation of existing sewage pumping stations and sewage treatment plants and installation of new sewage treatment plants to recover the maximum possible resources, especially energy to operate the pumping and treatment plants, and derive the maximum possible revenue to cover at least the operation and maintenance cost of these plants.
- Arrangements for bringing human and animal wastes from locations proximate to the sewage/sullage digesters for sanitary disposal and production of energy and manure.
- Providing sullage or sewage pumping stations at the outfall points of open drains, to divert the discharge from the river into the nearest sewers and treatment plants.
- Alternative arrangements to prevent discharge of animal wastes from cattlesheds located on the river banks.
- Low cost sanitation schemes in areas adjoining the river to reduce or prevent the flow of human wastes into the river.
- Biological conservation measures based on proven techniques for purification of streams.
- Pilot projects to establish cost effective systems for diversion of wastes now flowing into the river, their treatment and resource recovery.
- Pilot projects to establish feasibility of technology application in the treatment of wastes and resources/energy recovery.

Depending on feasibility, circumstances and availability of funds certain other components will need to be taken up in the present or subsequent phases, such as the following:

- Extending the existing sewage systems in the towns to cover the unsewered areas.
- Construction of large cattlesheds in the fringes of urban areas to facilitate collection of animal and human waste at suitable places and generating biogas (energy) and manurial matter at these points, which will also prevent the rainfall run-off from the urban area washing and bringing all the muck to the river during the rainy season and grossly polluting it.
- Prevention of throwing of dead bodies into the river.
- Regulation of the use of pesticides and insecticides for agriculture in such a way that surface run-off from cultivated areas does not carry excessive quantities of these materials to the rivers.

### Cost estimates

A tentative assessment of cost for several works that may be taken up for execution during the Seventh Five Year Plan period amounts to about Rs. 250 crores. These estimates are for only those Class I towns which are situated on the banks of the river. Similar works for the other towns situated on the Ganga may be taken up subsequently. In some cases, river characteristics, nature of the pollution faced and proximity of its sources may require contiguous urban areas to be taken up. In such cases, the cities chosen may not necessarily be Class I only.

The principal thrust of the Ganga Action Plan in the first phase is immediate reduction of the pollution load on the river Ganga and establishment of treatment systems which are technically and financially self-sustaining. Class I cities are proposed to be taken up first because population in Class I cities covers 82.3 per cent of the total urban population living in the urban settlements on the river bank. The volume of sewage produced in these Class I cities constitutes 88.5 per cent of the total volume of sewage produced. Furthermore, 15 of the 29 Class I cities have sewage treatment systems, though the coverage in some is only partial. There is an urgent need to optimise the benefits from these existing systems.

It would be worthwhile to take a look into the causes of pollution in these cities. In Patna and Varanasi, for instance, the sewerage systems cover 25 and 50 per cent of the population, respectively. In both locations, the city sewage flows into the river at more than five points. In both places, sumps and pumps have been installed to trap sewage at the outfalls. However, in Patna the pumps push the sewage directly into the river because there is no intercepting sewer. In Varanasi, the sewage is pumped into the intercepting sewer (locally called ghat sewer) which runs parallel to the river bank. No sewage in Varanasi would have flowed back into the river if all the components were in operation. Supplementing or providing the missing links and ensuring the performance of existing systems, thus, become important requirements under the Ganga Action Plan.

The Ganga Action Plan comprises several components:

- **Renovation of existing sewers**:The objective here is to prevent the overflowing of sewage from silted or broken sewers into open drains and rivers. To begin with only the outfalls and trunk lines will be considered rather than the branches or laterals. Though cleaning and repairing of sewer lines is an important element in any sewerage system, this is a time consuming and lengthy process. The cost involved in such routine functions for the city or the system as a whole cannot be treated as a part of the Ganga Action Plan. Each proposal for renovation of existing sewerage lines has to be established as essential for eliminating or drastically reducing overflow and, thus, stopping a given source of pollution.
- **Construction of interceptors**: In cities where sewage outfalls into the river exist, the immediate task is to divert the sewage to a suitable location for further treatment using sumps, pumps and intercepting sewer lines parallel to the river bank. Since the cost of diversion of sewage through a pipeline goes up as the distance of travel increases, length of diversion (intercepting sewer) has to be kept at a minimum. Sometimes, for want of space near the river bank, the location of the treatment may have to be away from the river bank. It may, therefore, be necessary for the sewage to be diverted to more than one location.
- **Renovation/construction of new treatment plants:** In cases of renovation, only those plants which are discharging effluents into the river and causing pollution should be taken up. In preparing schemes for both renovation and new construction, the recovery of resources in the form of methane gas or other forms of energy are to be specifically considered. The utilisation of the treated effluents for irrigation, pisciculture and

algae culture are to be examined. Where such items are not feasible for some special technical or other considerations, their omission has to be properly justified.

The approach to this action plan is distinctly different from conventional approaches to the treatment of municipal wastes. The items of resource recovery will not, therefore, be an afterthought but an integral part of the scheme. Each treatment location has to be viewed as a factory for resource recycling, where sewage is the raw material and energy, manure, poultry feed, fish, and irrigant are marketable products. The technical, financial and organisational requirements for operating such a treatment plant/factory have to be carefully studied.

- **Feeding human/animal wastes for sewage/sludge digester**: In partially sewered cities, sewage from unsewered areas along with cattle dung is collected, carted (headload or animal cart-load) and dumped into manholes of some sewer system. Places were such situations exist, arrangements for bringing the human and animal wastes from these parts and feeding the wastes to the sewage-sludge digesters for sanitary disposal and production of more biogas (energy) and manurial matters need to be considered.
- **Provision of sewage/sullage pumping stations**:
  Renovation or new construction may be necessary and considered mainly for outfall drains and intercepting sewers. In some cases boosting pumps may also be necessary.
- **Construction of cattlesheds**: The action plan has envisaged that in Phase II large community cattlesheds will be constructed in urban areas to facilitate collection of wastes and generation of biogas. Experience with projects in some cities has been mixed. For example, in the Calcutta metropolitan area, large cattlesheds with necessary facilities have been constructed but it has not been possible to shift any significant number of cattle to these sheds from existing locations. However, in some of the towns covered under the action plan, such cattlesheds may be existing on the river bank itself with wastes falling directly into the river. There may be specific cases where diversion or treatment of such wastes either by connection to sewers or biogas digester plants may be feasible.
- **Low-cost sanitation schemes**: Many states in the country have taken up low cost sanitation schemes such as the provision of pour-flush latrines with leach pits and other models, on an extensive basis in urban and rural areas. In the cities under the action plan where substantial parts are unsewered and where extension of sewerage will take much time and cost, such low cost sanitation schemes particularly in the parts of the city adjoining the river, may help reduce biological oxygen demand (BOD). Such schemes have to considered as a supplement to ongoing low cost sanitation schemes in relevant cities.

- **Biological conservation schemes pilot projects, etc.**: Where pilot projects are to be taken up to establish the feasibility of technology applications, the nature of the current problem, technology proposed to be applied, source of such technology and availability, the research components, the availability of technical personnel, cost, time schedule, etc. has to be studied carefully. The same approach is needed for biological conservation schemes, too.

### Effluent from industries

Under the laws of the land the responsibility for treatment of industrial effluents is that of the industry. While the concept of 'strict liability' should be adhered to in some cases, circumstances may require that plans for sewerage and treatment systems should consider industrial effluents as well. Clusters of small industries located in a contiguous area near the river bank and causing direct pollution to the river such as the tanneries in Jajmau (Kanpur) is a case in point. In some cases, wastewaters from some industrial units may already be connected to the city sewer and, therefore, merit treatment along with sewage in the sewage treatment plant. It may also be necessary in some crowded areas to accept wastewaters of industries in a city sewer to be fed to the treatment plant, provided the industrial waste is free from heavy metals, toxic chemicals and is not abnormally acidic or alkaline.

In such circumstances, schemes have to carefully examine the case of integrating or segregating industrial wastes for purposes of conveyance and treatment as also the possibilities for apportionment of capital and operating costs between city authorities and industries concerned.

It has been suggested that the treated effluent to be discharged into the river should contain:

- BOD of less than 20 milligrammes per litre (mg/l); and,
- suspended solids less than 20 mg/l.

The first meeting of the steering committee considered this issue and noted that even in several developed countries BOD of 30 mg/l and suspended solids of 50 mg/l were being accepted as limits. It was decided that for the present these limits may be followed. In specific cases where the requirements of use for drinking or other purposes immediately below the points of effluent discharge so require, the limits for treated effluents may be set at 20 mg/l for BOD and suspended solids.

## Organisational structure

Pollution control in the Ganga river involves many organisations like local bodies, industrial units, state and central agencies, specialist organisations, expert groups and so on. Above all, public cooperation and participation have to mobilised to sustain awareness about the problems of river pollution, to speedily implement the action plan and the maintain the purity of the river.

**C.P. Bhatt:** The government has paid attention only to the problem of pollution in the Ganga Action Plan and not to the overall problems of the Gangetic watershed. Will the programme ever be widened to include the problem of siltation?

**Sivaramakrishnan**: The programme that we have today is essentially one that is based on traditional sanitary engineering. But in the process we are beginning to understand the river. Ours is very much an engineering approach to begin with but leading on to several scientific issues. We are trying to get as much data as possible on the pollution factors, the flow variations, the standards of the receiving waters, the extent to which they can be matched with the standards of discharged waters, and so on. It will be an increasingly complicated exercise, especially when we get involved with the tributaries, which we should at some point. But to begin with we have to concentrate on the main river and we have to pay more attention to certain stretches rather than its entire length. This involves a series of public and engineering works, which is itself difficult enough to orchestrate.

Integrated watershed management is at the other end of the spectrum, which involves many ministries. When we started addressing the issue of minimum flows about a year ago the initial reaction of our fellow ministry, to put it very bluntly, was, "You are essentially a bunch of plumbers and janitors; what business have you to raise these river flow questions?" We decided to plug away. Now at least we are talking to each other. Thus, a series of questions will have to be addressed in stages. We must remember that when we are talking about integrated river management in the context of the Ganga, we are talking about the problems of one-third of the population of this country. It is a huge area and we have to acquire a certain amount of scientific competence and organisational ability to take on those questions. But we do have the potential. The Ganga Authority's membership is very broad-based. We have the Deputy Chairman of the Planning Commission, the Ministers of Finance, Water Resources, Environment and Science and Technology, and the three Chief Ministers of the states through which the Ganga passes. If we do not address these questions on such a high-powered platform, where are we going to?

This is a neat, linear picture that I am drawing. It may crack at several points. But that will determine the true environmental significance of our work.

I will say one thing more. Essentially, we are trying to market clean water, clean rivers. But I think we owe it to ourselves to admit that though we have a tremendous amount of emotion attached to the Ganga—we consider it pure by definition—our use of the river does not reflect this attitude at all. The majority of the people do not even accept the fact that the river is polluted. It is even resented. And so we have decided to move by saying, "All right, do we have a stake in clean water"? If we have a stake in clean water, aren't the chances of marketing that clean water better with the Ganga"? The river arouses all kinds of great emotions.

There are umpteen other polluted streams in this country—Tungabhadra and Sabarmati may even be aquatically dead. If we started cleaning the Sabarmati and Tungabhadra, they may even technically require more attention. So starting with the Ganga and its pollution is perhaps a good way of addressing a bunch of complex issues and whether we succeed or not is really the test.

**Anupam Misra** : The Ganga Action Plan is not really a people's movement; it is really a government programme. If that be the case, what happens in Delhi is very important, being the capital of this country. It may be logical to say that we cannot expect the small municipality of Hardwar to start cleaning up its waste. But why should Delhi, the seat of the government, be allowed to continue to pollute the Yamuna river in such a big way? The speaker pointed out that biogas is being produced from the sewage treatment works at Okhla in Delhi. But at the same time, the Najafgarh drain in Delhi continues to pollute the Yamuna river very badly. Can we not duplicate the experience of Okhla with the Najafgarh drain?

**Sivaramakrishnan** : As far as Delhi is concerned, there are, right now, two treatment plants. But even then Delhi does not treat even 60 per cent of its pollution into the Yamuna.

There are two or three important issues involved. One is technology. The underground sewage system has proved frightfully expensive. The high level of inputs in this area have not produced corresponding results. Compared to the innovations and the amount of money that have gone into drinking water supply, little has happened in the area of sanitation.

Secondly, even where technologies are proven, they have not been pursued vigorously. The Okhla treatment plant is a very interesting story. About 20 years ago, the Okhla sewage treatment plant got a German engine to run on a mixture of 80 per cent biogas and 20 per cent diesel. It was supposed to produce about 500 kw of power, which was enough to run at least part of the system. But engineers like to flick on a switch to get power from the grid rather than mess around with the engine, with so much maintenance involved. Whenever some of us visit it, the engine is started: otherwise it is just kept there.

Meanwhile, all the gas is pumped into the residential Friends Colony. Delhi is a greatly subsidised city. In Friends Colony, domestic gas is pumped into households at the flat rate of Rs. 25 per connection, which is unmetered. Some of the gas is also used in the Holy Family Hospital. This town gas system is not necessarily the best way to use sewage gas. It is so much more complex. Opportunities were available to optimise biogas recovery, optimise electricity conversion and proceed vigorously with electricity as a captive facility for the sewage treatment plant. This approach has not been pursued adequately.

It is very valid that if Delhi is not able to look after itself, how can we approach the Hardwar municipality? That is perhaps the reason why we are saying that let it be a grand financing programme to begin with, and starting with this river, we can induce municipalities to at least come up to the maintenance stage.

The third issue is people's participation. I would like to share some thoughts and problems. The Prime Minister launched this project formally in June 1986 at Varanasi and he declared "This is not a Public Works Department (PWD) job; this is a people's project." In Hindi, it comes through very well. He says: "*Yeh PWD ka kam nahin hai, yeh logon ka project banna chahiye.*" I really have been scratching my head, how do I make a bunch of sewage works a people's project?

It seems to me there are four ways. One is our own drum-beating. We are spending public money and we have got to tell the public what we are doing with their money. You can call it information and publicity—that is something we have to do. Maybe we do it a little more expensively, a little more loudly, a little less gracefully than we should.

The second is public awareness. This is where I come to an earlier point. When an investigative reporter on television went to Varanasi and asked some of the people squatting on the river banks, "What do you feel about pollution?" they said, "What do you mean? How dare you call the river polluted?" So there is a basic perception problem and we could take up programmes raising questions like, why should a citizen be concerned about pollution? What is his or her stake in it? Why should they be concerned about river pollution? But assuming they should be concerned, what should be the target group? Is it the elite, municipal administrators, pilgrims, city dwellers, students or people living along the banks and rural settlements? Is it all of them? And assuming it is, how do we address all of them?

The third question is public cooperation. As a child, I was brought up by the side of a small stream in Madras called Tamraparni. I was about six years old and my father took me for a bath in the river. While bathing, I did something which, according to him, I should not have done. I got a thrashing. I do not think my father went into any elaborate lessons about environment. He just thought that I should be thrashed and I was thrashed. And that is a lesson that I still remember—that is something I cannot do.

What has happened to us during these past 20 years? Even in a place like Swarg Ashram in Rishikesh, where we are dwelling on the highest plane of spirituality, it does not bother us to use the river as a ditch. The river can take it. It is a powerful mighty river at that point. But we definitely do damage there. It is a question of public cooperation: dos and don'ts. Around 1915, or even earlier, Pandit Madan Mohan Malaviya founded the Ganga Sabha in Hardwar. So when we go to Hardwar and to Har ki Pauri, there is a fellow screeching into the microphone: "Do not do this, do not wash clothes, do not use shampoo." They do not do this in Rishikesh. Go to Sindhia Ghat in Varanasi. It is a private *hamam* (bathing place). All possible detergents and shampoos are used. There are no dos and don'ts. There is a big population of turtles in the river, from Varanasi down to Mirzapur. These are scavengers. People from UP do not eat turtles; people from Bihar and Bengal do. As a result, they have disappeared downstream. There is now a project for conserving turtles and rearing them in captivity. I am told—I cannot prove it right now—there is some relation between scavenging turtles and floating carcasses. How do we tell the people and whom do we tell?

Fourth, there is the whole business of direct public participation. Chandi Prasad Bhatt has very kindly organised a few people by undertaking a *padyatra* down the stream. How do we really make it a massive movement? We have a problem. By definition if the government itself takes on the organising of these public activities, they become tainted—it becomes the kiss of death. At the same time, there are not sufficiently powerful grassroots organisations along the river, who could raise these issues. Therefore, how can we bring about participation at a conceptual level and rapidly scale it up? That is a tough job. I do not have all the answers.

**Sandbrook:** I want to relate a story about cleaning up the Thames, which was unknown at the time. When it was being cleaned, the leader of London's administration vowed: "I will catch fish in this river by the end of the year." One day he went on a barge to catch fish. Round the corner of the Thames were all his employees, throwing in live fish so that he could catch them a hundred yards downstream! The Thames is not as clean as some people say.

At the end of the day, the only way rivers in my country have been cleaned is indeed by integrated watershed management, whereby the whole catchment area, the water supply system, the quality of water supply and the quality of pollution discharges are all put under the control of one authority.

It seems that the Ganga has a very comparable situation to that of the Rhine with a multiple pollution load in different states. What degree of freedom do you have to set up uniform standards and what basis for industrial standards are you going to take? Are you going to have different standards going downstream, depending on the pattern of flow, or are you going to have to have uniformity for convenience of administration and how are you going to undertake monitoring and control?

**Sivaramakrishnan** : The Ministry of Environment and Forests, to which my organisation also belongs, has a Central Pollution Control Board which is officially responsible for fixing standards. It is a part of the ministry's job. There is now a new Act—the Environment Protection Act—under which these standards can be ratified and modified.

To begin with, for discharge of wastewater into rivers, a simple uniform standard of 30 ppm for BOD and 50 ppm for suspended solids has been set. Even this is going to be very tough to enforce. This presumes that if we want 30 ppm BOD in the discharging effluent, and we want something like 3 ppm in the river itself, then we are asking for a ten-fold dilution at the minimum. Even that is not going to be available. To begin with, we have a uniform standard for sewage treatment. But we are now in the process of seeing where different standards should be laid down.

The second is the discharge of wastewaters for different industries. Though they are not discharging directly into the Ganga, they are discharging into the sewers and drains which may or may not eventually find their way into it. But controlling the pollution from their discharges means getting into the problem of fixing standards for industrial effluents for the country as a whole.

The Central Pollution Control Board is a body run by the Centre. But water and air pollution are state subjects primarily. The central government has taken the initiative when there are interstate problems. The Centre also has an international role that is one of the justifications that it has used to enter air and water pollution control. Under the Central Pollution Control Act, every state has set up a State Pollution Control Board. It was only about six or seven years ago when many states set up such an organisation almost as a way of fulfilling the Centres's demand to control pollution. Sufficient attention was not paid to their technical competence and staffing. A few states have powerful bodies; quite a few others do not.

The whole process of standardisation has been somewhat marginalised. There are some minimum national standards and by definition, these tend to be the lowest possible, the easiest standards to which probably most would be able to conform. We are now in the process of going through standards on an industry-by-industry basis—for man-made fibres, chloralkali, electroplating, etc. Whether there should be a different set of standards in the Ganga basin, we do not know because within the country we cannot have much variance.

Our organisation and abilities for monitoring industrial effluents are still tenuous; they are improving now. Whether it is good or bad, there are something like 4,000 court cases, out of which the pollution control boards have won about a thousand. The rest are being contested.

As for river quality monitoring, whether it is the subject of increasing frequency, introducing a certain amount of automatisation, using biomonitoring specially for monitoring pesticides and heavy metals, and so on, there is a great deal of technical ground to be covered. Obviously, in the long run, we cannot afford a set of uniform standards, irrespective of local situations throughout the country or even throughout the basin.

**Agarwal:** The State Pollution Control Boards cannot relax the socalled minimum national standards. But they can certainly make them more stringent. Why can't the Ganga Authority take the Rhine kind of approach rather than uniform standards?

**Sivaramakrishnan** : As a matter of fact, we should. We are trying to work out an arrangement with the Central Pollution Control Board. But let us take the subject of minimum flows. We have an organisational problem. By definition, integrated watershed management is a multiple task activity and very large and highly respectable bureaucracies have been built over a long period of time for different purposes.

When I went to the Netherlands, I found that navigation was the principal use of the rivers and so navigators are very powerful people and other uses are considered subsidiary. Fortunately, maybe because of defence or other requirements and because it is a small country, it has been possible to bring about integration between different uses.

In India, irrigation has been the predominant use and in the caste system among engineers, irrigation officials are really high caste, the buildings and roads engineers are a little lower down

the scale, and the public works engineers further down. It is not easy to talk to irrigation engineers and tell them, "You should find a way of putting some water back." We will be decimated. This is something where one has to tread a little carefully.

The scale and intensity of the use of river water in India is also enormous. By trying to do all these things ourselves, being a central authority, we may lose whatever little clout we have. We would like to believe the Central Ganga Authority has more of a catalytic role within the government, rather than emerging as a single authority. A single authority has to take on direct regulation, and we will face a series of setbacks. If we take on the responsibility for direct investment, then we will face a range of pressures. Integrated watershed management, therefore, is a corporate approach and it should not be allowed to go in default because we feel we must have clout by getting into direct action with one of these activities. The real challenge is whether we can induct different ministries and organisations into a corporate approach.

**Sandbrook** : A quick comment—I am not arguing for integrated watershed management. I would much rather go along with receding environment standards. Uniform standards are much simpler to administrate, much fairer to each firm involved and easier to organise across national boundaries. Variable standards are a sophisticated trade-off between environmental quality at least cost—uniform standards may be more expensive but are much simpler to operate thereafter.

**Nani** : From the presentation I tend to believe the cleaning of the Ganga can primarily be done by the Pollution Control Boards and municipalities. I just do not understand the relevance of the Central Ganga Authority (CGA). Furthermore, apart from sentiment and cultural values, on what basis was the Ganga selected out of all the rivers of India? What is the money which is going to be spent on the whole cleaning process and over what period?

**Sivaramakrishnan** : Among river basins, in terms of the catchment area, population and various other criteria like watershed size, the Ganga stood out as the obvious candidate. Even in terms of pollution, despite all the State and Central Pollution Boards, we do not have very rigorous data comparing basins by their pollution loads. Maybe we can pick up one or two small rivers, like the Sabarmati or Tungabhadra, and say certain stretches are heavily polluted. But if we take the Ganga basin, Krishna, Cauvery or Brahmaputra, we cannot come to a very definite conclusion about which, technically, is more polluted than the other.

If the idea is to educate the public that water is a precious resource and, therefore, we must maintain the quality of rivers, I think it is obvious that we start with the Ganga. If we cannot bring about a mental change with regard to the Ganga, the chances of our bringing it about for another river are somewhat lower. That aspect weighed very heavily. One other purpose has already been achieved. The general cross-section of opinion now is, "Fine, you have started with the Ganga but you must take up other rivers."

We can admit that this is a political or moral perception, but it also seems very sound and practical. If we cannot get our act together with this river, the chances of doing so for some of the others are much lower.

Why do we need the CGA at all? Essentially because there are a number of things in our federal system which the state governments should be doing and do not do. If we want this project to kick off, it is not going to help us to say, "Come on, states. This is your responsibility. Don't you know what you are doing? Why don't you get on with it?" We have tried that; it has not got us anywhere.

The CGA's relevance is in trying to kick off this programme on the basis of some common objectives and a common approach regarding treatment works and the central government putting its money where its mouth is, by saying, "Okay, we will give the states the money to start off this operation." That is really its relevance. The Centre is not executing the scheme. It is being done by state governments, by their various agencies. Of course, problems exist; we are funding, coordinating and orchestrating.

How much does it cost? A very simplistic assumption was made in December 1984. We calculated that if these are the types of works needed to reduce the domestic wastes from coming into the river, this is going to cost so much per capita. The per capita cost multiplied by the population aggregated by cities is equal to the cost of the action plan of Rs. 250 crores.

This is not the way Project Managers do business. But if we started preparing estimates, the programme would not get started off in two years. So we got on with it, whatever the estimates. We get an estimate ready for Hardwar; we start. It now looks like the job is going to cost much more. But let us get some works going. If at the end of four years, we can show what we have done in Hardwar, Kanpur, Varanasi, Patna or Calcutta, we will stay in business. In terms of money, even though altogether we are supposed to spend Rs. 240 crores in the Seventh Five Year Plan, it is not much of a budget compared to the total central outlay. But it is obvious that it will take much more for all the works to be completed.

**Kocherry** : My question is around people's participation, many aspects of which you have discussed. Coming back to the religious sentiment, which I am quite interested in, in the sense that the whole dilemma can be irrationally mystified. It can either be rationally looked at or irrationally, and it can be exploited. For example, when we look at the Ganga irrationally, it does not matter whether it is polluted or not, because it purifies me. The pollution does not intrude. But if we look at it rationally, we cannot exploit the religious sentiment. It is very problematic if we do that. For example, in Nicaragua there was a Madonna feast. The event for them is an irrational celebration. But the socialist government made it into a rational feast, teaching and educating the people the rational way of looking at it. Even we need such an approach on a massive scale for the Ganga. If we do not do that and we do some work which nobody knows about, those who are going to the river to bathe will not get concerned about CGA's progress at all.

**Sivaramakrishnan** : I have just circulated a few papers. The Telegraph daily brought out a supplement on Ganga pollution. We did not pay a rupee for it. It was not part of our drum-beating budget. A whole series of very interesting articles were published, including one on leftists and the Ganga. It speaks about the present marxist government in West Bengal. It is very interesting that this government has been one of the most vociferous supporters of this particular programme.

What you have said is very interesting because the Ganga is not one of the longest rivers in the world; its importance is really in the faith of the people. That is where it draws its strength from. If we remove that faith completely from this river, we are removing a major source of strength. At the same time, is it at all possible to rationalise that faith and use it for some purpose?

I will give you an example. When I started this job, I went on my first visit to Varanasi. And in Varanasi, the density of priests of all persuasions is very heavy. One of them always addresses me as *balak* (child) or something. That fellow's initial reaction was: "How can you come around and be so presumptuous as to take on this job?" After two hours of argument, he finally came around and said: "What you should really do is as follows: Tell people it is a holy river, a *pavitra* river; if that is so, should you really treat it this way?" That was the kind of approach he was prepared to accept.

All along the banks of the river, when we look at the festivals that are being held and the various riverine events, we find that there is a great deal of attachment to the river. Can we do something to build on that faith and say, "If it is an object of veneration, let us treat it accordingly?" It is a very specific communication challenge.

We are now trying to work mainly through the cycle of melas (festivals). In the Kumbh in Hardwar we had a fairly interesting communications programme. We entrusted it to a voluntary organisation. The INTACH (Indian National Trust for Art and Cultural Heritage) offered to come. They put together a multimedia programme during the Kumbh. It consisted of a whole series of activities including puppet shows and dramas where the message essentially was that on this auspicious occasion, 'Don't allow this water to be polluted and don't pollute it yourself.' A fairly significant campaign was carried out There were several logistics problems. For instance, posters were put up in five languages. It so happened that the Gurmukhi posters got plastered in the South Indian *dharamshalas* and things like that! Just managing the show was not easy.

We found that the non-conventional media worked very much better. We tried it recently in the Sonepur mela also. Some time ago, we were addressing a group of people in Patna while opening an exhibition. The Chief Minister and most officials were present. Whenever we opened our mouth, more and more people would start to leave the hall. But we also had a group of singers who were singing in the local dialects like Bhojpuri and Maithili. These songs were not necessarily religious. They were about fishermen, about people living on the banks and so on. And most of the crowd came back.

We are trying to do the same thing with the next *Makar Sankranti mela* in Allahabad. We are trying to jump on to the mela sites. For about seven to eight months, there are melas along the banks of the Ganga. For three months, it rains and then there is no business and we stay put. Perhaps this is when we should

work on our communication programme. We are in the rudimentary stages. But we are definitely not trying to push too much conventional media into these locations. Instead, we try and relate as much as possible to the local dialect. But it isn't easy. Where are the people who can give us a script which can go on radio and not sound awfully preachy? We are struggling along.

**Ui:**In Japan we are laying down minimum national standards and different local standards according to local conditions and it works rather well. The recent improvement in the quality of Japanese waters came from local ordinances. It was not present in Japanese government documents until now. There are descriptions of national standards but very few local ones.

As an engineer, I have reached the conclusion that the piped underground system of drainage is too expensive. We cannot afford it. In Japan the per capita cost is around is Rs 100,000 and it is still increasing.

**Sivaramakrishnan:**Taking the total system in India, the per capita cost is around Rs 3,000.

**Ui:**Are there any legal and institutional difficulties in stopping industrial wastes from being discharged into the sewage system?

**Sivaramakrishnan:**A common treatment plant for industries was built by the government in Rajasthan. Now industries in Rajasthan are saying, "Just a minute, you asked us to pay for a common drainage facility. Did we not pay out? Did we not build one? Why ask us if it doesn't work?" We do have to go back to the basic principle: the polluter has to take care of the effluents within the factory's compound itself. Under the new laws, we do not anticipate legal diffficulties on this count.

**Ui:** Once I calculated how much was needed to stop organic mercury from the Chisso factory which caused the Minamata tragedy. My answer was that $ 10,000 dollars was all that was necessary to recover all the mercury being discharged by this company. In fact, they effected such recovery in 1968 and the real cost was only $ 5,000 dollars! Sometimes it is very cheap to recover all toxic substances at source. But this minute amount was not spent by the company at the beginning. Ultimately, they had to pay $ 1000 million by way of compensation. They could not pay it at all. That is a very good lesson for early treatment of industrial wastes.

**A.B. Mishra:** Two questions. While presenting the picture of the CGA and its structure, you did not say whether some research institutions or universities in India have been included. Secondly, when we know that 75 per cent of the pollution is from domestic sources and 25 per cent from industrial sources, why can we not straight away charge 25 per cent of the investment for treatment to the polluting industries, although we may not know their individual contributions to pollution?.

**Sivaramakrishnan:** The focus of the Ganga Action Plan was on domestic sewage. About 75 per cent of the pollution is coming from cities. We need Rs. 250 crores to take care of that 75 per cent of pollution. That money is really something that has to be paid by municipalities. But since they are not in a position to pay, the government helps them.

With regard to industries, the polluter has to pay. There is no difference between the public and private sectors. Everyone was trying to avoid whatever had to be done for whatever length of time they could manage to do so. BHEL's example in Hardwar is very interesting. Their capitive thermal plant did not pose a very complicated kind of effluent problem; it could be easily taken care of. They were finally confronted by telling them: "The Prime Minister is going to drop in on your plant on such and such a date; if the effluent is not cleaned, you fellows have had it." They worked almost round the clock for about four months and they set up a system which was so simple and, as Ui Jun said, which turned out to be reasonably effective as well. The only question I could ask BHEL was, "If it was so simple, why didn't you do it before?" Their answer was equally simpe: "Nobody asked us to."

We have several public sector undertakings along the Ganga, for instance, Indian Telephone Industries in Naini, a chloralkali plant in Ghazipur, ordance factories, mills under National Textile Corporation in Kanpur, etc. They said: "The Planning Commission has told us to apply project cost-benefit analysis very carefully; we are in no position to afford pollution control investment." We had to say, "Whether you like it or not, you will jolly well do it!" From public sector undertakings, we have now extracted some commitment that they will perform by certain dates and bear the cost. This is a better approach than uniformly charging them, even if we have to proceed case by case.

Let me very quickly state the position with regard to foreign technical know-how. Basically, this is a job for which technology is available within the country and being used and will be used. Rightly or wrongly, sewage treatment is not high-tech; this is not the microchip kind of stuff where countries are falling over each other making breakthroughs. The solution remains more or less the same as it was about 15 to 20 years ago. And quite a lot of knowledge is available.

But in certain areas like water quality modelling and monitoring, including sampling analysis, taking a systems approach, etc., we try and look at the Rhine model, the Thames, the Potomac, the Missouri, and those kinds of systems where foreign technologies can supplement our efforts. For instance, we are getting some assistance in exchange of models and software from the Thames people; we have some exchange of know-how and seminars and workshops with the US Environmental Protection Agency. The Dutch are helping us because they have experience with the anaerobic system of treatment with microbian blankets and they are also helping us design a particular programme for Kanpur. But this is only to supplement our Indian efforts and technologies.

We are trying very hard to expand the scientific content. We have 17 universities—from Garhwal down to Jadhavpur—involved in an integrated research project for the Ganga to monitor the physicochemical properties. We have the Council for Scientific and Industrial Research laboratories working with us and particularly the Industrial Toxicology Research Centre in Lucknow to monitor pesticides and heavy metals. The National Environment Engineering Institute is doing general monitoring and quality assurance. We have got the Indian Agricultural Research Institute helping us with the oxidation ponds in Rishikesh to see if they could be better organised. We have the Central Soil and Water Conservation Research and Training Institute in Dehradun, helping us with soil conservation in the Manshadevi hill. We are going out to get help wherever we can. An American friend was telling me that when the man on the moon programme was launched, the song, was, "If a man can be put on the moon, America can, America can." I would not like to make a presumptuous statement saying, "If the Ganga can be cleaned, India can, India can." But I would like to believe that this is one programme which should rouse the curiosity of a lot of people and should also serve as a platform not only for bringing engineers and technologists together but also biotechnologists and scientists. Whether we will collapse under the cumulative intellectual weight, I do not know, but I would like to believe that we can seize this opportunity.

**Agarwal:**I worked several years ago as a consultant with the WHO when the programme for the International Drinking Water Supply and Sanitation Decade was being developed.and from the evidence that was available to us from all over the world, it was very clear that sewerage systems as a technology for waste disposal are very inappropriate. Not only are they a very silly kind of technology—to transport a small amount of solids we waste so much water and then ultimately pollute the river where we dump these solids along with the water used to transport them. At the same time, from a social point of view too it is a highly inequitous technology.

The cost of merely getting yourself connected to a sewage system is so high that a majority of the urban households are not able to afford it and, in fact, even in the richer cities in this country, we find that not even 15 to 20 per cent of the households are connected. And these are the richest households. They are the biggest polluters. Since it is being said that it is domestic sewage which is really creating most of the pollution in the Ganga, is it not necessary, along with the huge intellectual task that we already have, to add this dimension of developing a new, more socially and environmentally appropriate system for disposal of human excreta?

We should have a big team of people looking at how to get rid of the sewage system because it make no sense environmentally. This technology came into existence at a time when Europe was literally raping the entire world and all the money that was being made through colonisation was leading to this extremely capital-intensive metropolitan development of Europe. We cannot adopt such a capital intensive technology. It is not an option open to us in the developing world.

Like any other developing country we love to follow what is happening in the western world. Since biotechnology is becoming very important there, we have got a separate department in the government to promote it. The secretary in the department of biotechnology was giving me this long list of very wonderful biotechnological innovations which will be made in India and which will be relevant for Indian society. I asked: "Can you somehow use this knowledge of biotechnology to develop a simple toilet? Are you thinking in terms of developing a composting toilet using all your sophisticated biotechnological knowledge?"

His answer clearly was that he had never though about it. I was not surprised. To my mind, if we really developed such a toilet, not only would all the effort that is being made for the entire Ganga programme not be required at all, but at the same time, we would have a technology which will be very very socially relevant. It could be afforded by the poor. The excreta can also go back to enrich the soil. Can you push this idea strongly?

**Sivaramakrishnan** : We have just started discussions with the Biotechnology Department. I have made the point that we have not been looking into cost-effective technologies for dealing with liquid and solid wastes and one of the first demands I made was ideas for sewerless sanitation.

With the Ganga Action Plan one of the modifications we introduced was the Sulabh Shauchalaya, which is low cost sanitation. Even there, there is a case for cost reduction. We are trying to push biogas plants in conjuction with Sulabh Shauchalayas, instead of trying to get hold of the sewage for the whole city, and pumping it vigorously up and down and taking it to one conveyance system. During the past year, we have not sanctioned major sewage treatment plants mainly for this reason, to see whether it is possible to come up with some alternative approaches. I was hoping that this programme will at least give us some intermediate solutions. In Mirzapur we are trying to do something. It is a very attractive city with a series of very sturdy, stone-covered and stone-faced open drains. There was a scheme for a conventional sewage system, which we threw out.

It may be a little bit messy, but if we have surface drainage, can we use it? Within pockets of a city, can we introduce low-cost sanitation on a more organised basis? A number of opportunities are available. This is what we were talking about with the department of biotechnology.

# The Forest Conservation Act: Environment vs development?

M.K. RANJITSINH

Under the forest policy laid down in 1951, one-third of the country's land should be under forests. Today, official figures put the forest area at 22.8 per cent of the land mass. This is not necessarily land under forests. Landsat imagery has shown that although there are supposed to be 75 million hectares (mha) under forests, the actual area is only 46 mha. Between 1950 and 1980, when the Forest Conservation Act was passed, some 4.32 mha of forest land were lost to the construction of roads and development activities like the construction of dams, etc. Annually 1,50,000 ha vanished in this manner. This destruction was not due to any forest degradation but by encroachments of human habitation and construction of thermal power projects and other development projects on forest lands. Because these figures did not take into account forest degradation, the result was that the official figures regarding the rate of deforestation were not true any more. Even more forest area was being lost which did not show up in the official figures. Landsat imagery has now shown that each year we are losing a little less than 1.5 mha.

Since 1976, the central government has been empowered under the Constitution to take action on the subject of forests. The Constitution lists the subjects which fall under the sole jurisdiction of states, central government, and then there is the Concurrent List of subjects on which both the Centre and states can act and legislate.

The Constitution governs our actions in many ways. There is a ministry at the Centre for environment, forests and wild life — mind you the word is separate, wild life. When I was drafting the Wild Life Protection Act in the early 1970s, I could not even make people agree to join this word because that is what the Constitution says! The legal experts would not even accept the phrase 'conservation of wild life' because the Constitution says 'preservation of wild life.' They said you cannot change anything unless you change the Constitution! When the Wild Life Protection Act was being drafted, it was clear that the central government was only a post office. The Government of India was dealing with forests and wild life but the states had to handle the implementation. We had no powers, prerogatives or controlling jurisdiction. But it was the then Prime Minister, Mrs. Indira Gandhi who said that once the Act is drafted, the central government will write to the states to adopt it. After she was elected in 1971, the first thing she wrote was "this is a non-political issue; will you please adopt the Act?". And it was adopted by the states.

That was the legal situation at that point of time. In 1976, however, there was an amendment to the Constitution and forests and wild life became concurrent subjects, so the central government could legislate from then onwards. This background is important because of the implications this has for Centre-state relations. Often the criticism is put forward by the states that the central government has done this *zabardasti* (compulsion), that this is an imposition, and that this is a manifestation of a lack of confidence in the states.

The states were requested in 1978, when both forests and wild life were subjects under the Ministry of Agriculture, to refer to the central government any case which involved the diversion of more than 10 ha of forest land. Guidelines were issued. The Planning Commission was told that it should not clear certain projects before environmental clearance was given. But the Planning Commission felt a bit constricted. The central government was also at the formative stage; environmental impact assessments were little known then; and, there was no law to control forest conservation and diversion. Despite these instructions, nothing really happened. It was business as usual. Therefore, in 1980, the Forest Conservation Act was passed. It is a very small Act with only five sections. It says basically two things: a) no reserve forests should be diverted and de-reserved, without the prior permission of the Central government; and b) no land which has been notified or registered and mentioned in government records as forest land, will be used for non-forest purposes.

This Act has brought everything to a screeching halt. Allegations are being made that the central government is holding up progress. The fact is that forest land is being conserved far more than before. From 1980 till today, in six years, the total forest area diverted is only 33,875 ha. Prior to that, since independence, 1,50,000 ha were diverted every year. Now the rate is almost 5,500 ha a year and this includes diversions for certain proposals and projects which were more or less a *fait accompli*, where the state governments had started the projects but had not officially diverted forest land for non-forest purposes. In some cases, the project had proceeded far over a period of time and later on permission was given.

There are other ramifications of this Act for project authorities. We have received 2,200 project proposals since 1980. We are insisting on data in a prescribed format, and there is a dossier of guidelines which has been circulated to all the states. The guidelines were just issued piecemeal and then they were collated, approved by the Prime Minister, who was then the Minister for Environment, and sent to all the states. They are in a form such that the states know how to process a case, how to come to the centre for permission, and what they have to prove.

The states have to tell us what is the type of forest at stake, its density and the possible alternatives. The Centre doesn't always say 'no'. Often there are other options too. When the Centre has asked the states to provide maps, it has been found that old habits die hard. Instead of opting for other land, the project authorities have deliberately included forest land in the project. Since forest land is not privately owned and it belongs to the government, it is the cheapest form of land. Nobody has to be unsettled, no compensation has to be paid, land does not have to be acquired — so the previous practice was just to take forest land. So if a line had to be drawn on the map to make a road or erect a transmission line, it was better to go over forest land. Why go over people and acquire private land! That was the option that everyone took. Even now the tendency persists, unless the centre says "No, you can't."

But it must be said that there has also been a sea-change in attitudes, but more because of the people, and especially NGOs and voluntary organisations. The change has come about not just because of the pressure that Parliament and the Ministry of Environment may have exerted, but because of a consciousness on the part of the people. This consciousness may not be to the extent I may want or environmentalists would want, but it is

growing and that is a good thing. Maybe not all, but many government servants, particularly the younger officers, also feel there is a change. We can see this when projects are being prepared, that the project authorities have made a conscious effort to avoid the takeover of forest land. Secondly, what used to frequently happen in these projects, is that displaced people used to be settled in forests. The central government has tried to put a stop to this practice.

Our forests have been under considerable demographic pressure not only because there is a large population in the country. There is another factor which is seldom realised — the commercial system of forestry which owes its origin to two Germans. Some 110 years ago, when the Kaiser's mother was the daughter of Queen Victoria, and the afforestation of the Black Forest was going on in Germany, Europeans believed that the Germans made the best foresters. India had three foresters called D. Brandis, W. Schlich and B. Ribbentrop, who was a grand uncle of Count von Ribbentrop. These three Germans became the first Inspector Generals of Forests of this country. At the time they formulated the working plans and working schemes, there was a shortage of labour, and in the period that followed, there was a conscious effort by the British Forest Service to settle people in forest villages in forest areas. That has a direct impact on forests today, though not much is understood or written about this. These people were transported to the new villages and given land for cultivation so that they were available for forestry, maintenance of roads, cutting trees, hauling timber, looking after the elephants, providing *begar* (unpaid labour) and putting out fires, etc.

In the process, the environment suffered a lot. Grasslands, for instance, are very important. In India, as in many other countries, grasslands have no godfather. Some of the grasslands are the most productive ecosystems in the world. And yet, there is much talk about forests, mountains, many other ecosystems like wetlands, estuarine systems which are also very productive, but the grasslands have been the most to suffer in this country because of grazing. There was almost a policy that whenever land was to be acquired for agriculture, it would be grassland, in alluvial riverine areas, alluvial flood plains, the areas in the sal forests which are called "forest hollows" and where all the animals used to come out, where there were marshlands, and where the deer or the rhinos, the grass-loving animals of Southeast

Asia, used to roam. As a result, these animals have been the most to suffer because they had adapted themselves to the grasslands and could not adapt to the forest when the grasslands had gone. Thus, we find in the forests of this country and elsewhere — in Burma, for instance — forest villages settled in grasslands, where not much forest had to be cut and there was reasonably level land, usually at the bottom of the valley with some alluvium and water close by.

When we look at the forest map of this country, we find these little pockmarks. As the population increased, the people spilled over into the forests. And, today, what do we do for these people? Are we not going to build roads to these villages? Are we not going to provide basic human amenities? These further add pressures on the environment.

When I was the District Magistrate and the Collector of Kanha and Mandla, the Kanha National Park was part of my charge for three years. I had then proposed shifting one forest village outside the park. It was the first forest village to be moved out of a park or any forest area in recent times and resettled for conservation purposes and not for a development project. I had estimated that the 85 families in this village, which cultivated 880 acres and had 1200 head of cattle, had an impact on something like 12 sq km of forest area. The moment the village was resettled, the ecological recovery was dramatic. And this is the crux of the issue. In this country, unlike temperate countries and Arctic regions, there is a tremendous potential to recover if the area can get half a chance to regenerate.

Thus, with this sort of situation, whenever there is a development project which involves a certain amount of forest area, there is a big chance that some people will have to be resettled. Initially, the authorities executing the project, never used to settle a forest village outside the forest area. The people used to be resettled in another forest area because they had to be given land, and land was easily available in forest areas. Therefore, another forest area was honeycombed with human habitation. Either actual diversion of forest area used to take place or the people were simply given monetary compensation and asked to fend for themselves. The project authorities would wash their hands of the people by saying, "They've been given Rs. 8,500 and that's it, now they can look out for themselves!" For the displaced village people, we all know, this involved social trauma. Even when a wildlife manager transports a wild animal, every effort is made to

shift a social unit, a herd. In the case of a tribal community, a sum of Rs. 5,000 or Rs. 10,000 is given, and they become slum dwellers and the community disintegrates or they go and do some more illicit cutting of trees and settle in a new forest area saying, "that's the land we know, that's the life we know."

Now the central government does not clear a project till it knows how many people are to be resettled, who are the oustees, and what is the provision being made for land for the oustees outside the forest area. Certain projects have got held up. The government has taken a second or third look at certain projects but it has been very particular that resettlement should be outside forest area. Tehri dam is one example where the whole town was resettled in another forest area (but this was before the Forest Conservation Act came into being).

The government also insists on compensatory afforestation, as far as possible, on non-forest land. If the project takes away 630 ha of forest land, then 630 ha of forest land must be added. The project is not cleared till alternate land is acquired and handed over to the project authorities, who are told to plant trees on that land. The government, however, ran into problems with this policy, because in some areas, non-forest area was simply not available but degraded forest areas were. Thus, if the Chief Secretary certifies that there is no forest on forest land, and that there is no private land that they can acquire, then in those special circumstances, the central government agrees to the afforestation of a degraded forest area as compensatory afforestation and the cost is borne by the project. The cost-benefit analysis has also to be worked out and the central government looks at alternatives.

It is now widely realised that there are certain types of forests that are irreplaceable — sal, for example. The replacement is usually eucalyptus or *Acacia auriculiformis* or whatever. In some cases, silver oak has been planted on the top of a hill. Silver oak is certainly a tree but the department does not permit a monoculture. Secondly, there should be, as far as possible, indigenous species, and thirdly, to the extent possible, trees which are of ecological and economical use to the tribals living in that area.

The same principles apply to mining areas. The department has been very reluctant to clear cases where strip mining is involved. It has been trying to insist, as far as possible, that strip mining is done with an underground tunnel. This means that much less coal is mined and the cost is a little more, but there is less ecological damage and cost of restoration. The government has also been insisting that when there is a certain amount of strip mining to be done — because it has been permitted in the past or cleared for whatever reason — there should be scraping of the topsoil, so that when refilling the area, the topsoil is restored at the top of the land and the land is afforested.

Another interesting fact is that whenever an area came under the submergence of a dam, previously the project authorities used to clear fell forests till the high flood level. Now many of the dams do not get filled up till this level. So why should this clear felling take place till the high flood level? Why even to the full tank level? In the Tawa Project in Madhya Pradesh, trees were cut to the full tank level, and it took three cuttings before the dam came up. Now the central government insists that trees will be cut only till three or four metres below the full tank level, depending on the gradient. So cutting the forest even to the full tank level is no longer allowed. Trees get innundated at the root level for a few weeks or maybe a month or two, then the water recedes, and they continue to stand and protect the tank from siltation and washing away of soil.

The department of environment and forests has cleared some 1,060 projects so far. It has rejected a good many. A number of cases have been closed, where the department has asked for detailed information. If this information is not received in three or four weeks, the case is closed, though it can be reopened if the project authorities come back to the department. But the message is clear — there have been violations and these cases have been rejected. The fact that some state has gone ahead with a project and that it has been sanctioned and has even got World Bank assistance, is no criteria for the clearance of the project. The Prime Minister, Shri Rajiv Gandhi has himself enforced this rule on more than one occasion.

The department also received about 104 cases of waterworks for drinking purposes. All of these were little projects, and quite of lot of them were in the hills. We have a problem in Uttarakhand in Uttar Pradesh in the sense that practically all the area there is forest area. So even if something small has to be constructed, forest area has to be diverted. The department has been lenient in small projects for drinking water. It has actually cleared — if I remember clearly — 102 out of 104 projects for drinking water.

But in the case of transmission lines, the department has been

parsimonious in giving permission for the cutting of trees. The department has tried to convince the authorities to move their wires a little higher and let the trees be. They say that they have to have a certain clearance before they instal lines. The department tries to persuade them to retain a certain amount of forest as shrubs or even stumps. In certain cases, forests were cut to lay the lines and then yank them up to make the lines taut; that diversion has also been reduced.

The department is conscious of the projects that have to be permitted. For instance, if there are military barracks coming up, or a little transmitter has to be set up, they are allowed outright. But the land now remains with the forest department. It is given away on a long or short lease. Previously the land used to be transferred and the forest department no longer had any control over it. Now, in most cases, the land is not transferred even to the irrigation department. Even when the land is actually inundated, it still remains in their hands so that the project authorities cannot start other plantations on it.

Thus in a variety of ways, the Forest Conservation Act has been used to restore order into the use of forest lands by development projects.

**Agarwal:** This is a very important Act in the country, because in a way it brings out all the conflicts between environment and development. It forces the government to sit in judgement over whether the environment is more important than development or vice versa. Accordingly, a decision has to be made in favour of a project or against it. It will be important to watch the implementation of this Act because it will clearly reveal to what extent environment is being given priority over unsound economic development.

There is an important aspect of this Act, which makes it horrendous for so-called 'developers'. This is the demand for land for compensatory afforestation. Since only 23 per cent of India's land is controlled by the forest departments, and over a period of time the country wants to afforest at least 33 per cent of the land, it means that if any project is allowed to divert forest land, to conserve the quantity of forest land, some other land which is classified as non-forest land must be transferred to the forest department. This is what most project authorities find very difficult. They either have to go and acquire government revenue land or private land. Most revenue land has already been encroached upon or it has been given away to the poor under land reforms programmes. Panchayat lands cannot be acquired by the government because they are owned by the village communities. Acquiring private lands, of course, means paying market prices. Project authorities, therefore, get very upset when they see a lot of forest land which is lying barren. They say, "Why don't you let us afforest barren forest land in compensation for any forest land that we may be taking over?" But that would allow the total forest land, which is only 23 per cent of the total land area, to slowly shrink. And they complain the Departnent of Environment is holding up progress.

This year, in May, we had been asked by the Prime Minister, Mr. Rajiv Gandhi to deliver a lecture to his entire Council of Ministers. Thereafter, we were requested to make a presentation to all 27 Parliamentary Consultative Committees attached to various ministries of the central government. The Prime Minister said that he not only wanted all MPs to be informed about the importance of the environment, but also each ministry to discuss its own role in terms of its impact on the environment at these committee meetings.

At one of these meetings, I got some sense of why he was so keen to see these lectures delivered. While he was presiding over the Parliamentary Consultative Committee of the Ministry of Planning, an MP asked: "You're the leader of this country. Could you please tell us how do we involve people in environmental programmes?" He replied, "Well, there are a number of ways one tries to involve people. One, you can have various programmes in which people are directly involved. We are trying to involve, for instance, voluntary agencies as much as we can. But there is another way to involve people and that is involving the people's elected representatives. That is usually the most difficult thing. Everybody comes to me and asks, 'Why are you holding up this project for a few trees?'. We only think in terms of the short term, but not the long term. This is why I have asked Mr Agarwal to deliver these 27 lectures so that we can all appreciate why environment is so important for the survival of this country."

Certain types of forest are irreplaceable. SMITU KOTHARI

Indeed, the pressure from various states, MPs and government departments against the implementation of the Forest Conservation Act has been quite considerable. I have seen it in operation myself. At a meeting of all the Secretaries of the Union Ministries dealing with development programmes, organised by the Department of Environment at the request of the Prime Minister, there was hardly a Secretary who was happy with this act whether he dealt with power, irrigation, mines, atomic energy or whatever. The Prime Minister strongly defended the act.

For all of us interested in environment, the strict implementation of this act will definitely be of great interest. All kinds of efforts are made to circumvent it. I understand that at a meeting held recently in Bombay, the Prime Minister pointed out how state governments try to do this. Apparently there is a rule that if you want to lay 1 km of road, you do not need the permission of the central government under this Act. There was one state government which wanted to make a 50 km road. It made a one km road and left a little space, and then made another kilometre of road and so on. I was told later by one officer that this was the State of Uttar Pradesh. Is this true?

**Ranjitsinh:** One of the most pressing demands in Parliament has been to delegate a certain quantum of power in this matter to the state governments. If the land required is less than a certain amount, they say they should not be asked to come to the Centre. Otherwise for every hectare of forest land, they have to come to the centre and things get held up. What the Prime Minister was referring to was the fact that every case which had involved more than a certain area of forest land had to go to the Prime Minister. And there was a strange reluctance to go up to the Prime Minister. That is what they were trying to do with roads or transmission lines. At present, every case involving more than 20 ha of forest land is routed through the Prime Minister's office. (Note: The Prime Minister was then Minister for Environment.) We have tried to make this norm less than 20 ha, especially for transmission lines. There are now less than 50 cases pending. There is also a demand that some proportion of forest land should be kept for state governments to do as they think fit.

**Chandi Prasad Bhatt:** Let me talk about the impact of this act on Uttarakhand. In one case, a bridge is being built across a stream. On one side, the support for the bridge has been built, but not on the other because it falls in forest land and clearance has not been obtained. This will need only a small amount of land. But examples like this, which are indeed few, are used by local politicians to campaign against environmentalists.

Again, for a footpath, only a small amount of land is required. If even that is held up in the name of the Forest Conservation Act, what will happen to the efforts the government is making to enthuse people regarding forest development? The Act could become counter-productive. People will turn against the forests because these villages have not seen roads even 40 years after Independence.

When a big project is held up, the big interests involved — whether from the public or the private sector — will run around, fill in forms, and chase the central government for permission. When small projects, which are meant for the poor people, are held up, then nobody in the local bureaucracy will work hard to get these projects cleared, by providing information required by the Centre promptly.

This could lead to a lot of resentment amongst the local people, who are regularly informed that the papers have been returned by the central government, which has not granted clearance. Under the act, is there also a provision for penalising a government officer who does not fill in the requisite forms?

I am providing another example from Uttarakhand where a cement plant has already been built. It has acquired 9.6 ha which is not forest land but borders a reserved forest. In fact, a road has been built through the reserved forest. This has been done without the permission of the local forest department or clearance from the Centre. Earlier a sub-divisional magistrate (SDM) had

allotted this land to the company. The then district magistrate (DM), who was sympathetic to the local people and the campaign they had launched against the project, had cancelled the SDM's order. However, the commissioner stayed the implementation of the DM's order. He claims that he has talked to the Union Environment Secretary, who in turn may have also written to the UP government, but the state authorities have not replied. The local people are angry that all these big people can get permission from the local officials, but when it comes to little projects which help them the projects are held up.

**Ranjitsinh:** Bhatt has cited the case of a footpath. This is a new development that footpaths require permission. I have not so far come across a single case. If there are no trees to be cut, if there are no forests to be diverted for non-forest purposes, to walk through the forest is not the sort of thing to come before the central government for permission. It is up to the state government to bring such cases to our notice.

In UP, there have been a very large number of cases involving small projects. In Uttarakhand, there is a lot of forest land. The central government had even started a campaign. It got UP government officials to come to Delhi and 148 cases which were pending with us for more than a year, were cleared in about 15 days.

I would like to mention three things regarding roads. Because such a big area is involved, it is essential that the total area of a project is known before it is permitted. Otherwise permission is sought piecemeal. The government, therefore, asks where is the road being taken to, which areas will it be running through, etc.

The same applies to electric transmission lines. There have been irrigation projects in which the government has been told that there are six canals but there is no mention of five of them. We, therefore, ask, where are the five canals going to be linked? Please bring a composite proposal.

In many ways roads are the most devastating method to destroy the environment. It is not enough to worry about the area which is actually cleared but the fact that vast areas are being opened up to illicit and other exploitation, including for fuelwood.

The third aspect is particularly dangerous. In areas with limestone in the Himalayas, road construction results in the discarding of overburden on the sides. When a hill is cut for a road, the debris is dumped on the side causing a landslide, which, once it starts, sends down more rubble. All that is the direct result of making a road. Not that roads should not be built. But the Centre is trying to insist 'Please don't dump the rubble on the side'. It is also being insisted upon that when there is an irrigation project, the fuelwood obtained from the trees to be submerged should be supplied free to the workers or at the most, something can be deducted from their wages. But nobody should sell the wood. If labourers are going to live and work in the forests, they will cut wood. So firewood should be supplied to them. The Centre would like the same during road-building.

Small projects do not take much time to clear, provided the necessary information is available. They are cleared in three or four days, once the data is available.

About the cement factory, I have a vague recollection and if I remember right, we asked for a report from the UP government. I had again reminded them and I was told that they are going to send one.

**Agarwal:** Bhattji's point is very relevant. There are a lot of interest groups who are against this Act. They can easily use the kind of gimmickry described by Bhattji to turn the local people against conservation by telling them "Look, it is the central government which is not clearing the project." Actually, they may not even be putting the project proposal forward because they are not interested in it. Do you have some kind of mechanism to deal with this? Otherwise because of lack of knowledge, people may be led to think that it is the Act which is standing in the way of their needs.

**Ranjitsinh:** This is a matter of communication. Government is not always capable of doing this. Especially in remote places, the state government should undertake this. Any role that a voluntary organisation can play will also be very helpful. They should be there, explaining to the people what the do's and don'ts are, where the people come in, and where the Forest Conservation Act is not relevant and where it has to be applied.

**B. Choudhri:** I am from Madhya Pradesh and I have two questions. First, we have a large influx of animals from other states — goats, sheep, camels, etc. — destroying our forests.

Secondly, as regards the forests that are being submerged by the Narmada Sagar Project, where is the land being allotted for compensatory afforestation?

**Ranjitsinh:** The MP government should evolve a grazing policy which will ensure regeneration of forests. Forestry is

based upon regeneration and there are tremendous opportunities for this. There have been grazing rules and policies in the past which said, 'this area will be grazed by 'x' number of cattle at this rate.'

The MP government tried to stop animals from grazing in the forests but the matter went to the Supreme Court. The grazing of cattle from outside the state had been stopped. But the graziers won the case. The Supreme Court said that the state government can have a policy saying there should be no grazing in a forest area by any sheep or goats, but it cannot have a policy where there will be sheep and cattle of MP grazing with no holds barred, but cattle from adjacent states are disallowed. The result is that the forest areas have been thrown open. The state government must ultimately get a coherent grazing policy.

It all comes back to the question of grasslands. There is nothing emerging under the forests. See the degradation in the forests. Forest revenue is largely from teak. Why? Because teak is a wonderful tree. It is fire resistant and not eaten by cattle. It is meant to germinate after a year; if there is a fire, it germinates the same year. Fire helps it; it does not help other trees. It also has fire-resistant seed. And the most important thing is, when it is cut, it throws up coppices. Now the MP government is taking the third or fourth coppice. But sooner or later there will be an end to every root system. There will be a coppice crash; roots will die and nothing else will come up. That is what is coming now, because grazing is not allowing anything else to come up. The government may have more teak trees, but the tribals are not benefitting.

As for the area which is coming under submergence in the Narmada Project scheme, it had one species — Anjan or *Hardwickia binata*. This tree does not regenerate. It is not coming up now. The tree on which the Nepanagar Paper Mills factory was based, is gone. It cannot be planted. Bamboo is surplus in two districts of Madhya Pradesh — Bastar and Balaghat. Barring three or four districts, the rest are all deficient. At the moment the bamboo is flowering in Balaghat; there will be a shortage there.

The state Forest Secretary stopped the export of fuelwood out of Madhya Pradesh. There was a lot of hue and cry, but ultimately, fuelwood stopped going out a year ago.

It is the last chunk of forest left in the Narmada valley. Once that goes, there will be no forest left. And one of the sources of supply to Nepa Mills will go. Where will they get their supplies?

They have identified areas in certain districts for compensatory afforestation, partly in Khandwa and mainly in Khargon. These were originally forest lands which were denuded. How good will these be for regeneration, having witnessed soil degradation? Riverine forest area is being taken away in exchange for degraded land.

**Laba:** What do you do in a situation like Manipur where the state government has control over only 9 per cent of the total forest area? In 1972, the Autonomous Hill District Act was passed by Parliament, giving power to take over the rest of the forest area.

**Ranjitsinh:** The situation in Mizoram and Nagaland is worse. A number of things could be done. They are not all satisfactory but they could help.

The first task is to identify the respective areas that are with the forest department. The best way to protect forests and wildlife is by having national parks in the name of tigers, elephants or birds. This has worked very well. Project Tiger is one success story. We started off with it. The areas best for the tiger have not been declared sanctuaries. There may be better areas outside these sanctuaries as far as the number of tigers is concerned. But areas which were representative of the tiger habitat were chosen and the tiger was used as a ploy. I am very glad it was done because forests are far more important than the tiger. Manipur can also set up as many sanctuaries in the area as it can.

**Increasing illegal felling: fuelled by commercial demands.**
SMITU KOTHARI

Secondly give money to local people and acquire land. This has been done before too, elsewhere. The third, and most important, factor is again the work of voluntary organisations. The ultimate solution is people's involvement. If they feel that they get something out of forests, if they begin to discern an economic motive in rational and appropriate use of forest land, they will do it.

**Laba:** The immediate problem we are facing is an annual flood cycle. Have you tried to consider the possibility of a national policy on catchment areas?

**Ranjitsinh:** All the forests in the southern area along the Manipur river have been lost. People can take up afforestation, based on usufructuary rights. Bamboo and pine do very well in that area. Can the District Councils which are so powerful not do something? As far as having a policy on water catchments, this is one of the few things that we have experimented on, and we have got some dramatic results. After the Project Tiger areas were established in the dry, deciduous areas and grazing was stopped, we found that two streams which used to stop by the middle of the year were still flowing four months later. And some streams had become perennial.

**Saint:** Making wasteland development and afforestation a people's movement, is a declared and accepted policy of the government. You have made out a case that people have to get a stake in protecting forests, they have to feel that there is something in it for them. Yet, recently, a note was put up by the Ministry of Environment at a meeting relating to the release of degraded forest land to the poor for afforestation, arguing against this policy.

People like us are frankly confused. In the note, it was suggested that there are dangers of the land being permanently lost and there are cases where it has not been regenerated and that it has been further degraded. There is a need to make this land available to the poor in the community to regenerate it, because this is the one last asset they can hope to have. It can be the basis for removal of mass poverty. Can you tell us where the Forest Conservation Act stands on this issue? What are the other hurdles in the way?

**Ranjitsinh:** There are two issues. One is that social forestry

## MINISTRY OF LAW, JUSTICE AND COMPANY AFFAIRS

### (Legislative Department)

New Delhi, the 27th December, 1980/Pausa 6, 1902 (Saka)

The following Act of Parliament received the assent of the President on the 27th December, 1980, and is hereby published for general information:—

## THE FOREST (CONSERVATION) ACT, 1980

### No. 69 of 1980

[27th December, 1980]

An Act to provide for the conservation of forests and for matters connected therewith or ancillary or incidental thereto.

Be it enacted by Parliament in the Thirty-first Year of the Republic of India as follows:—

Short title, extent and commencement.

1. (1) This Act may be called the Forest (Conservation) Act, 1980.

(2) It extends to the whole of India except the State of Jammu and Kashmir.

(3) It shall be deemed to have come into force on the 25th day of October, 1980.

Restriction on the dereservation of forests or use of forest land for non-forest purpose.

2. Notwithstanding anything contained in any other law for the time being in force in a State, no State Government or other authority shall make, except with the prior approval of the Central Government, any order directing—

( i) that any reserved forest (within the meaning of the expression "reserved forest" in any law for the time being in force in that State) or any portion thereof shall cease to be reserved;

(ii) that any forest land or any portion thereof may be used for any non-forest purpose.

Explanation—For the purposes of this section "non-forest purposes means breaking up or clearing of any forest land or portion thereto for any purpose other than reafforestation.

Constitution of Advisory Committee.

3. The Central Government may constitute a Committee consisting of such number of persons as it may deem fit to advise that Government with regard to—

( i) the grant of approval under section 2; and

(ii) any other matter connected with the conservation of forests which may be referred to it by the Central Government.

Power to make rules.

4. (1) The Central Government may, by notification in the Official Gazette, make rules for carrying out the provisions of this Act.

(2) Every rule made under this Act shall be laid, as soon as may be after it is made, before each House of Parliament, while it is in session, for a total period of thirty days which may be comprised in one session or in two or more successive sessions, and if, before the expiry of the session immediately following the session or the successive sessions aforesaid, both Houses agree in making any modification in the rule or both Houses agree that the rule should not be made, the rule shall thereafter have effect only in such modified form or be of no effect, as the case may be; so, however, that any such modification or annulment shall be without prejudice to the validity of anything previously done under that rule.

Repeal and saving. 17 of 1980.

5. (1) The Forest (Conservation) Ordinance, 1980 is hereby repealed.

(2) Notwithstanding such repeal, anything done or any action taken under the provisions of the said Ordinance shall be deemed to have been done or taken under the corresponding provisions of this Act.

should, to my mind, lead to farm forestry. People must plant on their own land also, especially on degraded land belonging to poor marginal owners. The other is the afforestation of degraded forest land with the forest departments. More people should not be allowed to come in to settle in forest land, under the guise of afforestation. But this should not be treated as a closed chapter. Why cannot parts of forests be taken up for afforestation? But before that is done why cannot areas outside forests be taken up?

**Saint:** Everybody agrees that the afforestation effort has to be a very major and immediate one. But let me give you figures from my district, Udaipur. These are official figures. The total forest area belonging to the forest department is 10,500 sq km. Of that, it claims, 3,000 sq km is under tree cover; 7,500 sq km is without. Last year, with all the effort at its command, we are told that it was able to plant 150 sq km out of 7,500 sq km. At that rate, we can work out what their capacity for regeneration is.

Dr Kamala Chowdhury said, very explicitly, that we have to take the people into confidence, repose in them the trust and means to regenerate forests. Why are we avoiding that? Why do we not want the option of opening up degraded forest land? Is this the official policy? What are the hurdles?

**Ranjitsinh:** A different approach is possible. The current policy is not the final word. A single-track approach is not good. But there has to be a certain amount of caution. If rules are relaxed for the poor, they may also have to be relaxed for others.

**Stoel:** Our national forests in the United States were established in 1897 for two basic purposes: one was to protect these forests and the other was to protect water supply. Those were the two general principles. This Forest Conservation Act seems to resemble the National Environmental Policy Act, where our government is also allowed to take action only after an examination of environmental impact and alternatives. One feature in the policy regarding clearance in forest areas is information about the project and the opportunity to comment was made available to the public. In India, under this particular statute, is there any provision for people outside the government to find out about the nature of the project, the pendency and nature of the application, alternatives that are being considered, etc?

**Ranjitsinh:** No.

**Hiremath:** While there are all kinds of red tape and problems in the way of land being made available to the poor, in November 1984, 30,000 ha of land in the high rainfall areas of Chikmagulur and Shimoga in Karnataka were made available to a highly polluting industry called Harihar Polyfibres. Because we were able to build up a people's movement in some of these areas, the forest department has left this area and moved elsewhere.

Because of a law suit in the Karnataka High Court, we have obtained a document which says that the forest department have entered into another lease agreement in July 1986, under which they have allotted reserve forest areas to this new joint sector corporation, Karnataka Pulpwood Limited to set up captive plantations, especially of eucalyptus, to meet the needs of Harihar Polyfibres.

In an area, about 40 to 45 km from Dharwar, which is reserve forest area, there are two or three tracts of forest lands which were used for grazing land. About 500 ha have been given in this

new company and already by August 1986, this land had been planted. What help can we get from the Forest Conservation Act?

**Ranjitsinh:** I am also of the opinion that clear felling for afforestation should not be done. If we are spending millions to do afforestation in non-forest areas, why should we clear fell forest areas? At the present moment, clear felling is an accepted principle of afforestation. So legally, even if someone is clear felling a forest to substitute with a commercial species, they cannot be penalised. It is not being felled for non-forest purposes, and it is not a non-forest corporation.

**Hiremath:** You mean taking a grazing part of a reserved forest and planting eucalyptus on it will not be an infringement?

**Ranjitsinh:** No, because it is still planted with trees.

**Hiralal:** What is the procedure if someone wants to start an afforestation programme? How many days in advance should one apply before starting work and to whom? If somebody violates the Act, what is the punishment? In Gadchiroli district, there are two dam projects, where without permission under this Act, the Maharashtra government has spent Rs. 4 crore on construction and cut 250 ha of forests.

In Maharashtra, under the Employment Guarantee Scheme, a number of employment generation works have been undertaken by people who quarry stones. Because of the Forest Conservation Act, they cannot do this under the Employment Guarantee Scheme. We also believe that it is not correct to do this type of work, which destroys forests.

This year, because of the pressure to generate employment, the government passed a resolution that employment be created under the Employment Guarantee Scheme by digging forest tanks and undertaking irrigation forestry. These tanks are not for crop irrigation but for developing forests only. Is it necessary to take permission for this type of work too?

**Ranjitsinh:** First, the *modus operandi* for permission. The interested party has to furnish data to the state government, which forwards the case to the centre. If it does not, the centre cannot consider the case. There is no question of starting without permission. If the interested party is keen on quick disposal, it should furnish all the facts.

The state government also provides facts to the centre. The views of the state's Chief Conservator of Forests (CCF) are insisted upon. The CCF is often pressurised to give in. Some have the courage to say 'no' and yet the state government persists. At the Centre, we can also read between the lines: "Oh, these are lovely forests", says the CCF, "but since the state government deems this project extremely important in the public interest and for such and such reason, permission may be granted." It is quite obvious the CCF wants to save this forest.

The second question concerns violations. There have been violations which have come to the notice of the Centre and the Prime Minister has taken action. Many projects have not been sanctioned. As yet, there are no penal provisions but they are under consideration.

**A.B. Mishra:** We congratulate the ministry for resisting the Bharat Aluminium Corporation proposal to mine bauxite in the Gandhamardan Hills. But although BALCO's proposal has been rejected, it is already lifting bauxite. Is this not unauthorised lifting of property? No action has been taken against the company. People resist the mining but are unable to prevent it.

Also, I would like to know that when the Ministry of Environment has rejected the proposal, why has the Ministry of Mines appointed another high-level committee to examine it? What can we NGOs do to see that the Forest Ministry has the final say in this?

**Ranjitsinh:** I can hardly advise you. Do what you know best and what you do best; what you have done to arouse public interest. The public interest has always had a very vital role to play in this regard.

When a request is made for reconsideration, certain factors are reexamined. There is always a court of appeal. Everyone has the right to go to the Supreme Court.

# Mutual Concerns: A summing up

Throughout the Third World, there are a large number of people whose daily existance is closely linked with their immediate environment—they depend on it for food, fuel, fodder, building materials and also for the raw materials of their crafts and trades. Any degradation of the environment, then, impinges directly on the quality of life of these largely rural, and poor, communities. As environmental destruction proceeds, age-old environmental safe guards and traditional conservation practices are abandoned in a desperate quest for survival. Poverty increases, environmental destruction hastens, poverty increases further. The cycle is a vicious one, with total catastrophe the only possible end.

But throughout the Third World, voices are being raised in protest against this process. They are the voices of the marginalised people themselves, of middle-class social workers, of concerned individuals, and even the occasional bureaucrat.

The participants at the seminar on 'Environment and people's subsistence' had precisely this concern at heart—the growing marginalisation of vast numbers of people, and the more recent phenomenon of growing protest. In the discussions that followed the presentation of papers, a number of issues of mutual interest arose. We present here a summary of the last session, in order to share some of the key suggestions and issues which arose.

## Earth Day

With environmental conflict and concern growing at every level—from the village level to the urban university level—there is a need for national fora at which people can express and interchange their ideas. The existing fora have their limitations—workshops and seminars organised within the four walls of a room have limited participation and reach, and the World Environment Day is too international and too bureaucratised, drowned more by *official* celebrations and statements. There is no occasion which is large-scale, popular, unbureaucratised, uninhibited, grassroots-based and national. In the US, this widespread need to express oneself on environmental issues took the shape of Earth Day in the 1960s. Tom Stoel described the Earth Day as follows: "Next to Martin Luther King's 'I Have a Dream' declaration in Washington in the 60s, it was the most memorable public occasion in my lifetime. Earth Day was a grassroots manifestation of environmental movements coming together in America. No one organised it as such; it just happened. People channeled it in different directions and it took place in a hundred cities across the country, with tens of thousands of people drawn into it. It was successful, because it emerged from the bottom. It was a day that belonged entirely to the people." The American experience showed that everyone who wanted to express what they felt about the environment but did not have the opportunity to do so for years, were able to come out with it on Earth Day, which was absolutely amazing.

The suggestion that a day along the lines of Earth Day be organised in India was warmly welcomed. Earth Day could be used to create nationwide environmental concern, to point out all the environmental problems, and to highlight what the people themselves had achieved. One participant pointed out that with the Indian's love for festivals, the entire day could very well turn into one of festivity and of celebration of nature. It was also agreed that something as broad-based, as flexible and as popular as an Earth Day could possibly serve to reflect the immense range of environmental concerns in the country today and stress the unity of all Indians amidst enormous cultural and biological diversity.

### National Pollution Fighters' Network

What was most evident at the seminar was the participants felt need to keep in contact with each other—both within the country and abroad. S.R. Hiremath pointed out that four or five participants were specifically involved in one way or another with the fight against pollution. Unlike the case of dams, forests and a few other issues, anti-pollution activists have not worked

collectively. Hiremath favoured a loose network of such activists, without forming an established group of any kind. At the seminar were representatives of at least four different movements—from Orissa, Tamil Nadu, Kerala and Karnataka. In a vast country like India, small groups working in different places can easily feel completely isolated—especially in terms of information and support. Swifter communication between NGOs could be aided by the setting up of loose networks between groups fighting on similar issues like pollution. Furthermore, it was felt that if groups working on similar issues banded together to press their cause or demand policy changes, they would have more of an impact than isolated groups would. With this in mind, the participants expressed the need for a National Pollution Fighters' Network.

### Freedom of Information

What makes the environmental rights movement such a sensitive and potentially revolutionary movement is the implication that it carries—once people start asking for a better quality of life, for rights over their forests, water and air, for a say in the way their own environment is planned and used, they begin, in effect, to ask for a say in the governance of the country. They begin to force their way towards a functioning democracy, and for a relationship of accountability between the governed and the government. At the moment, one participant pointed out, the people are asked to abide by laws, but are rarely asked to participate in formulating them and are not trusted with enforcing them. Crucial to this notion of a functioning democracy, however, is the free flow of information—between the government and the people and between different groups of people themselves.

Because of the barrage of questions that the officials at the seminar had faced, an idea was mooted of yearly or six-monthly public meetings with various officials, bureaucrats and politicians at which people could ask questions or clarify doubts. Perhaps officials would also welcome an occasion to meet representatives of NGOs, which they would normally not meet. The officials could brief people on what laws were being drafted and how they proposed to implement them. The Federation of Voluntary Organisations in Rural Development, Karnataka (FEVORD-K), according to S.R. Hiremath, regularly organises such meetings.

Chandi Prasad Bhatt pointed out that unless people were involved in the formulation and enforcement of legislation that directly concerned them, the legislation was doomed to fail. He pointed out that progressive laws were dependent for their implementation on the presence of certain enlightened officials and if these were transferred, the entire legislation proved worthless. However, if people were familiar with the law, they could themselves ensure its enforcement.

Specifically on the Forest Conservation Act, Bhatt wondered how, when there were such expectations of the law, could people at one and the same time claim it was too bureaucratic a piece of legislation and yet expect popular participation. He felt that if one or two secretaries to the Government of India were to change, the entire act would prove worthless. The only way to ensure that this did not happen was to encourage people to participate in its enforcement. Bhatt cited the case of the draft Forest Policy which was successfully stalled a few years back, when voluntary agencies managed to get copies of the document in advance. He was emphatic, though, that it was not enough to circulate information in English, it had to be done in regional languages also if the concept of free information flow had to have any real significance.

The relationship between NGOs and the government has always been a delicate one. But, as Ganesh Pande observed, the government itself cannot be treated as a monolith. There are diverse forces within it just as there are within the voluntary sector, and if groups could identify sympathetic individuals and interact with them, it could prove mutually beneficial. Instead of trying to choose between *either* co-operating *or* confronting, perhaps a new equation, of *both* collaborating *and* confronting, could be created. In this way, complacency within both spheres could be avoided and accountability promoted.

**Fragile ecosystems and threatened cultures**

The problem of information flow is even more acute when it comes to groups situated in ecologically fragile areas and threatened ecosystems, which were often culturally isolated. Yambem Laba, the participant from Manipur, pointed out that there was little contact between the people in the Northeast and the rest of India except through the army, bureaucrats, and traders. Because of the isolation, their opinion was rarely sought on policy matters that would affect them directly. The Forest Conservation Act, for example, an issue of widespread debate in the rest of the country, had little relevance in Manipur where only a fraction of the forest land belonged to the forest department. Hence the problem of deforestation there was totally different from the rest of the country. Unfortunately, it was too often the case that policy was formulated with little respect for, or recognition of, biological, cultural and administrative diversity. The Rubber Board has recently gained access to Northeastern states. It wants to shave off virgin forests and make these areas more 'productive' by producing rubber.

Agarwal emphasised that if the environmental movement had taught him anything, it was to respect not only biological diversity but cultural diversity as well; the two were, in fact, closely linked. Activists have talked about grazing lands and nomads a lot of the time, but have seldom sat down to talk to the representatives of nomads or a group of them. It was thanks to people like Tom Kocherry and others that at least the interests of marine fisherfolk were beginning to receive attention. At the same time, the interests of riverine fisherfolk were completely neglected. Although environmentalists had some knowledge about threatened ecosystems, they knew much less about threatened cultures. And yet, there was so much to preserve in them as they were so ecologically sound. To witness the transformation of Ladakh, for instance, was heartrending. In many tribal cultures, the process of change started long ago and traditions could not be easily distinguished today.

More than one participant stated that in the future, meetings, workshops, and seminars ought to make a special effort to involve those living in ecologically fragile and isolated areas—Ladakh, the northeast, tribal areas like Bastar, etc. —in order to promote a better exchange of ideas, to learn more about other lifestyles and also to ensure that these people are given their due rights at the national level and their environment, on which their survival depends, is conserved. Kishore Saint suggested that this growing battle against the extinction of lifestyles was a contribution that the environmental movement in India could make to the rest of the world.

**Development models**

The colonial period in India saw an imposition of a Western-oriented pattern of development. The post-independence period has seen an acceleration of this process, with the race towards indiscriminate modernisation. In the process, there has been a complete lack of attention paid to traditional forms of knowledge, in this process, the poor, and the fringe-dwellers, have been marginalised and impoverished even further. Inspite of what economists may tell us about a diminishing number of people below the poverty line, a sensitive eye can not miss the severe stress that has now come to characterise the lives of the rural poor. Western science and technology, with its emphasis on readymade technological fixes, and developed as it was in and for a different milieu, has completely ignored the local characteristics of Third World societies; for example, the vital link between women, ecology, and the subsistence household. The vast majority of households in the country's rural areas are still out of the reach of the modern cash economy, firmly planted in the subsistence biomass-based economy. With growing competition between the modern cash economy and the subsistence-based economy for basic raw materials, land, and water, the struggle for survival is getting fierce.

## Foreign aid

The participants from abroad were keen to create a climate of public opinion where aid to developing countries would be carefully monitored. The World Bank and other institutions were giving billions of dollars to the Indian government or industries to put up factories which were not really required and created a lot of problems for the Indian people. As this was money from tax payers in the First World, they were obviously keen to know how their money was being spent. In India, people were fortunate to enjoy the benefits of a democratic system, unlike most Third World countries, where military regimes flourished and were being supported by arms provided by First World countries. It was, therefore, pointed out that technological imperialism often enters in the guise of development aid. Whether it is the multilateral development banks (MDBs) or the various bilateral aid agencies, the quality of this aid in terms of the conditions attached to it and the projects for which it is being given, has to be carefully monitored. Faster and better communication and cooperation between Indian and foreign groups on the question of development aid could lead to the creation of an informed and influential lobby to monitor the activities of aid agencies and to avoid the sort of environmental disasters that have been witnesed at various sites both within the country and in other Third World countries.

## Environment as a tool for cultural education

The environment debate is one that can no longer be put on the shelf. Within it, lie the seeds for change, for creating national awareness, and, above all, for forging a greater understanding of people and cultures. Anil Agarwal pointed out that for him, the concern for the environment had turned into a fascinating and challenging discovery of India. While the idea of science and technology that most of us grew up with invariably led us to think of the West as a model for growth, the subject of environment led to an examination of the cultural and biological diversity of human society and invariably took us deeper towards the roots of our own culture. Often, even those engineers and technologists who really had the country's interest at heart unconsciously ended up transmitting an inappropriate culture, because their immediate response to any sort of problem was to look to the West and to try and imitate it as best they could. But the return to one's own culture supported by an increasing environmental consciousness, was not a blind harking back to traditions. Its end-result was an understanding of the essential rationality of each culture, how it had emerged in its own particular ecosystem and the way people had developed social and production systems, behaviour patterns and survival techniques. Once this was understood, there was an immediate respect for all cultures and the question of cultural conflicts arising out of the feeling that one culture is superior to another, completely disappeared. So, far from narrowing one's world view, examining the socio-ecological roots of one's own culture really broadened one's mind immensely.

Apart from the mutual affirmation of solidarity, the seminar proved to be different things to different people—as could perhaps be expected. While to the Indian participants the meeting was essentially one for establishing contact and discussing strategies, to the foreign participants it seemed to have opened out the country in a way that no other guided tour, perhaps, could. As Miguel Grinberg said, "It was like attending a three month course in three days!"

The meeting also helped to correct a few misconceptions that exist about India: "I have been to many international conferences," said Ui Jun, "and wherever I go I meet Indian scientists speaking Oxford English, with crisp phrases, rhetoric, and impeccable logic—but nothing to do with reality! For the first time, I have come across people similar to those in the Japanese grassroots movements." Chatfield, too, felt that he had now met a part of the true Indian environment movement, which was alive and well but which faced problems which were absolutely stunning.

Chatfield and Stoel observed that it was always amazing how the issue of environment could bridge seemingly unbridgeable cultural, social, political and geographical distances—as had happened at this seminar. This feeling of tremendous diversity united in a common concern was perhaps best summed up when one participant said, "Every meeting of environmentalists has taught me a great deal about humankind. It is probably because of this spirit that people are, literally, one. When Barbara Ward wrote *Only One Earth*, the essential message was that there was only one humankind. This is probably the basic message of this meeting: oneness in diversity is an issue we have got to understand."

# Participants in the seminar on environment and people's subsistence

**Pat Adams** of Toronto-based *Energy Probe* works primarily on energy issues. Her project looks at the international aspects of Canadian energy, aid and trade policies. The group views energy more as a handle to discuss environmental issues,particularly the creation of risk by corporations and government, which people have to face. With about 20,000 supporters in Canada the group researches and monitors the government on a variety of issues including nuclear power, oil and gas, and transmission lines. They are concerned not so much about the products that the Canadian government pushes but more with the process by which development schemes are chosen, in which popular participation is limited. Adams is also actively involved in the campaign against those World Bank funded projects which are implemented without proper environmental assessment.

**Anil Agarwal** is Director of the Centre for Science and Environment, a group of individuals and writers whose basic concern is how to create public awareness of environmentally sound development issues. Although he started his career as a science journalist with the Indian Express and the Hindustan Times, and was later with Earthscan, he is today well-known for his contribution to the environment debate and particularly for his role in conceptualising the State of India's Environment reports. He was awarded the Padma Shri in 1986, and has recently been awarded the UNEP 500 award.

**Chandi Prasad Bhatt** hails from Chamoli district, deep in the Himalaya in northern Uttar Pradesh. He works with the Dasholi Gram Swarajya Mandal which pioneered the Chipko Movement. A committed Gandhian, he was involved both with the Satyagraha Movement and the Bhoodan Movement, working in his native Garhwal region in the UP Himalayas. In the late 60's he formed a labour union in Chamoli district. In the following years, he also helped to mobilise villagers, expecially women, to fight for the prohibition of liquor sales in the district. The Chipko Andolan, which sprang to life in 1973, has been his most abiding involvement. While the movement earlier laid most emphasis on protecting and conserving forests, the stress now is on how to regenerate and manage forests in a sustainable way. Chandi Prasad Bhatt received the Magsaysay Award in 1982 and the Padma Shri in 1986. He has recently been conducting *padyatras* along the major rivers—the Ganga, Godavari and Indravati—in an attempt to understand the problems and lifestyles of those who live along the river banks and the state of the river ecosystem.

**Radha Bhatt** was born in the middle Himalyas and for the last ten years, has worked with her institution, Laxmi Ashram. The Ashram works for women and the environment, with the conviction that women are vital for protecting the environment. The women of Laxmi Ashram had been organising themselves before any kind of environmental movement or activities had started in their region. When the Chipko Movement started, they were associated with it. Recently, they have been involved with the problems of open cast mining. The women have been campaigning not only to stop the mining but also to educate people to reclaim land.

**David Bull** is the author of "A growing Problem: Pesticides and the third world poor". He was formerly Executive Director of the ELC.

**David Chatfield** works for the international organisation Greenpeace. Before joining Greenpeace, he worked for Friends of the Earth for about eight years on international issues, primarily energy and pesticides. In 1985, he joined Greenpeace, an international organisation that works on marine issues, toxic wastes and disarmament. Indeed, Greenpeace drew its name from the idea that environment and disarmament are connected and is probably best known for their involvement in saving the whales and for having their ship, Rainbow Warrior, blown up. Greenpeace has contacts with people in about 50 countries. Many activists in Greenpeace adhere to the idea of non-violent direct action, out of experience and having read about Gandhi and also through the Civil Rights Movement in the US.

**Banwarilal Choudhri** became involved as a Gandhian social worker in rural development in the villages of Hoshangabad district in Madhya Pradesh. In village after village, he and his colleagues heard about waterlogging of the land caused by the Tawa dam. This resulted in the start of the *Mitti Bachao Abhiyan* (Save the Soil Campaign) which attracted national and international attention.

**Dr. Kamla Chowdhry** is the Chairman of the National Wasted lands Development Board. Her academic career has spanned several pheres—from mathematics and philosophy to a doctorate in social psychology.

She has earlier been Director, Research Centre for Group Dynamics (Ahmedabad Textile Industry's Research Association); Research Associate, Harvard Business School; and played a key role in the setting up of the Indian Institute of Management, Ahmedabad where she was also teaching for several years.

From 1978–81 Dr. Chowdhry was Advisor, Public Planning and Management, Ford Foundation. Following this, from 1982–1984/85, she was Vice-Chairman, founder member and later Executive Director of the Society for Promotion of Wastelands Development.

Dr. Chowdhry is on the Board of about 12 prestigious institutions within the country, and is the author/editor of several authoritative books on management policy.

**Suresh Diwan** is an activist with the *Mitti Bachao Abhiyan*.

**Darryl D'Monte**, a well-known journalist, was formerly resident editor of the Indian Express in Bombay, and earlier, assistant editor with the Times of India. He is the author of *'Temples or Tombs? Industry Versus Environment: Three Controversies* which he wrote as a Homi Bhabha Fellow. At present, he is a Fellow of the Centre for Science and Environment.

**Anwar Fazal** from Malaysia, founded the Consumers' Association of Penang in 1969. For the past 12 years, he has been working with the International Organisation of Consumers' Unions (IOCU), a global network of some 150 consumer groups of which he is now President. IOCU has two offices, one in Holland and one in Penang. Fazal is perhaps best known for spearheading the global campaign against infant formulas. He has also been responsible for global campaigns against the mis-use of drugs and pesticides. He has been awarded the Alternative Nobel Prize.

**Miguel Grinberg** comes from Argentina, which according to him, has little to do with the Third World since most of its aborigines were killed in colonial times and afterwards by the settlers. Grinberg belongs to a small citizens' group that was started in 1979, called Promundo, which means 'pro-world'. He has been a poet and a journalist, but in the last seven or eight years, he has been involved in bringing out magazines, doing radio programmes, teaching social ecology, and doing whatever is possible to create consciousness among people, especially the young.

**Mohan Hirabai Hiralal** works in Gadchiroli district of Maharashtra, a major tribal area of the country. Mohan is involved in a workers' organisation dealing with the Employment Guarantee Scheme. The Employment Guarantee Scheme guarantees an unemployed person a job within 50 kms of residence and within 15 days of demanding employment in Maharashtra. Mohan is also involved with farmers' and tribal organisations working in the area, and the *Jungle Bachao, Manav Bachao Andolan* (Save the Forests, Save Humanity Movement). In 1984 different groups and political parties came together in Gadchiroli to organise a big demonstration against the Bhopalpatnam and Inchampalli dams, whose construction has since been suspended. The dams would have displaced thousands of tribals.

**S.R. Hiremath** from Karnataka, is working against pollution in the Tungabhadra river. His group, Samaj Parivartana Samudaya (SPS) started with rural development work in a cluster of 21 villages on the banks of the river, and gradually came face to face with pollution. The group's role is to support the people through scientific methods and by bringing scientists in contact with the people. From rural development, SPS moved to environment and about 65 small groups from different parts of Karnataka formed a federation of voluntary organisations. This groups has taken up the social forestry programme as a major issue. The group's approach to environment has been derived from the KSSP. They are now also involved in opposing the location of the Kaiga atomic power plant. SPS is currently involved with a campaign that is trying to cancel the allocation of thousands of hectares of common lands to a joint sector company, Karnataka Pulpwood Ltd, for growing eucalyptus. The Supreme Court has stayed the transfer of the land.

**Ui Jun,** orginally a sanitary engineer, and one of Japan's most outstanding environmentalists, ran a department of environment in the University of Tokyo for the past 15 years, till he shifted to Okinawa University in 1986. Instrumental in exposing the Minamata disease tragedy and a leading environmental campaigner in Japan, Ui Jun has recently been active in opposing a new airport to be built on coral reefs in Ishi Naki Island. He is also associated with the Monitoring Bhopal Group in Japan, which was founded by the Minamata group.

**Yolanda Kakabadse** is the Director of Fundacion Natura, a major environmental NGO in Ecuador. It started eight years ago and has 3500 members. Foundation Natura works in three areas: (a) coordination of people and organisations (both government and private) that are related to environmental and natural resources management, (b) environmental education, and (c) trying to influence government and private authorities on legislation and policies related to the exploitation of natural resources. The group also works with several small projects supporting native communities in the Andes. It is also trying to raise an awareness of the need for conservation, principally in the Amazon Basin.

**Father Thomas Kocherry** belongs to the National Fishermen's Forum in Kerala. This is a trade union with a lot of supportive work like research, education and welfare. The forum is trying to organise marine fisherfolk who number about 6.5 million. The organisation has a membership of 20,000.

**Yambem Laba** belongs to the northeastern state of Manipur. He has been involved in introducing a programme called *Adventure for the Masses,* taking schoolchildren for extensive treks through the mountains, during which they take note of the deforestation that has taken place and its consequences. At stake is the survival of a Himalayan culture. Laba is also a journalist.

**A.B. Misra** teaches geography in Sambalpur University in Orissa. Around 1980, he founded the *Orissa Environment Consciousness Society*. Gradually, he has become involved with a federation of NGOs in Orissa called Orissa Action Group. He is involved with the campaign in the Gandhamardhan hill area. A support structure has been set up through some trade union leaders and the struggle is growing. He has recently been involved in trying to develop an organisation called Vivekananda Institute for Social and Allied Services (VISHWA).

**Anupam Misra** works with the Environment Cell of the Gandhi Peace Foundation in Delhi. The cell assists a dozen small local groups based in different parts of the country. He describes himself as the "clerk" of the environment movement, since much of his time and effort goes into getting people in New Delhi to understand the concerns of various small groups across the country, whether it is through newspapers or by filing a case in the Supreme Court. Anupam has been a constant campaigner for the environment, standing behind all kinds of groups from the Chipko Movement to the *Mitti Bachao Abhiyan*.

**Sunita Narain** has been an active environmentalist for the past eight years and is a co-editor of the *Second Citizens' Report on the State of India's Environment*. She has worked extensively on forests, common property resources, and related issues and is currently co-editing the third citizens' report.

**Narayana Murthy**, otherwise known as Nani, works for Community Action for Development in North Arcot district, Tamil Nadu. The group consists of volunteers who have been fighting a stiff and unequal battle against the pollution of the Palar river and surrounding groundwater by leather tanneries. The group has also been concentrating on forestry problems in the Javadi Hills and providing consultancy to the social forestry programmes organised by the state government.

**Ganesh Pande** comes from Kanpur, an industrial town with a population of some three million. A timber technologist by training, he has been working as a trade union leader in Kanpur in textiles, chemicals and fertiliser factories. For the last five or six years, he has been trying to involve unions in occupational health and safety for workers. He feels that there is scope to identify those common areas where organisations involved in environment and trade unionists involved in workers' safety can come together. He was also involved in Bhopal trying to organise support in different cities. Ganesh Pande works closely with the Society for Participatory Research in Asia (PRIA) on a variety of occupational health issues.

**M.K. Prasad** is in charge of the environment brigade of the Kerala Shastra Sahitya Parishad (KSSP). The organisation has about 23,000 members 2,000 experienced activists, and 600 units spread out over the state of Kerala. KSSP has been using scienct as a tool for social activism. It has taken on several environmental campaigns. The KSSP has campaigned against the pollution of the Chaliyar river by a Birla-owned rayon factory. The campaign resulted in the temporary closing of the factory, which now dumps its effluents elsewhere, but has consistently refused to set up a treatment plant. It has also successfully campaigned against the Silent Valley hydroelectric project with the support of many other NGOs. KSSP is now engaged in organising the residents of the valley to demand the benefits which they were told they would derive from not having the hydel project in the valley.

KSSP spreads its messages through folk arts, using traditional forms but transforming all religious and other themes into new themes in science. KSSP also campaigns against the use of banned drugs in health delivery systems. It also campaigns against World Bank-aided social forestry programmes, and against the World Bank-aided shrimp breeding programme which will reduce the backwaters of Kerala by three-quarters and badly affect the traditional artisans and fishermen.

**Pugalendhi** is a colleague of Narayana Murthy and has also been actively involved in the battle against the tanneries.

**Dr. M.K. Ranjitsinh** is Director, Wildlife Preservation, and Joint Secretary (Wildlife) in the Ministry of Environment and Forests. He has made major contributions to the study and conservation of wildlife in India. In recognition of his efforts, towards the conservation of world flora and fauna he was awarded the Order of the Golden Ark in 1979. At the time of the seminar, Dr. Ranjitsinh was Joint Secretary (Forest Conservation Act.)

The author of several renowned publications, Dr. Ranjitsinh is well-known for his pioneering efforts to establish and preserve national parks. In particular, he was responsible for the upgradation of Keibul Lamjao Sanctuary to a National Park and the saving of the brow-antlered deer; the preservation of the *barasingha* in Kanha National Park; the establishment of the Eravikulam National Park which holds the world's highest population of the Nilgiri Tahr and as key planner of Project Tiger. He has also served as Regional Advisor in Nature Conservation in the Bangkok Regional Office of UNEP. During his tenure as Forest Secretary for the State of Madhya Pradesh which has almost one-fourth of India's forests, he established eight new National Parks, 11 new Wildlife Sanctuaries, with a total area of almost 12,000 sq. kms. Dr. Ranjitsinh was responsible for the amendment of the Wildlife (Protection) Act 1979, which resulted in the total ban of trade in endangered species in India, and was the architect of the long struggle which ultimately banned the export of frogs' legs from India. He drafted the Wildlife (Preservation) Act of 1972, the first comprehensive wildlife legislation applicable to the whole country.

**Kishore Saint** has had a varied teaching career. He was first in Africa,in the late '60s. In the early 70s, when he was working in the US with an experimental higher education institution, environmental consciousness spread, and he returned to India. He has been working in Udaipur in southern Rajasthan since 1972, in rural development and adult education. Although he initially felt that the problem of growing deforestation could be taken care of by rural development and adult eduction, he later realised that the ecological-cultural crisis could not be relegated to the background, and had to be addressed directly. Since then, along with others, he has been working with the Bhil tribals of the region and is trying to evolve a way of regenerating the devastated hills and improving the quality of life for the tribals themselves. Kishore also works with the Ashoka Foundation which supports "public cause enterprise"—trying to identify individuals who wish to launch new initiatives on social issues and to provide them support.

**Ujwala Samarth,** formerly a journalist, works at the Centre for Science and Environment. Her work centres primarily around urban issues, and the forthcoming publication on the state of India's urban environment.

**Richard Sandbrook** works with the International Institute for Environment and Development. He first become involved in environment issues in 1969 through Friends of the Earth. He describes himself as 'an environmental fixer'—enabling organisations such as Friends of the Earth and other citizens' group in Europe to have their impact at a national and European level. For the past ten years now, IIED has been concerned with the environmental effect of the aid which flows through the international system to developing societies. IIED is also concerned with fisheries, agriculture, forestry and a whole range of issues, often in co-operation with organisations in the South.

**Madhu Sarin**, an architect by training, is perhaps best known for her work, together with the women of Harijan Nada, in developing the Nada Chulha—a smokeless stove. She is one of the few people in this country who view the smokeless stove as a technology of women, for women, and by women.

Madhu came to work on the issue of the smokeless stove while she was working on a watershed development project in Sukhomajri village in Haryana, a outstanding watershed development project where natural resources are not only being regenerated, but are being equitably shared. Madhu and her associates have ended up developing a whole methodology for studying stoves through women, and in the process, a group has evolved, presently working in about seven different states.

**Mr. K.C. Sivaramakrishnan** is the Project Director of the Central Ganga Authority and Additional Secretary, Ministry of Environment and Forests.

After joining the Indian Administrative Service (IAS) in 1958, Mr. Sivaramakrishnan was involved in magisterial and administrative work in various districts in West Bengal and later held the posts of Programme Officer, Calcutta Metropolitan Planning Organisation (1965); Director and Chief Executive Officer, Assam Planning Organisation and Durgapur Development Authority (1966–70); Secretary, Calcutta Metropolitan Development Authority (1970–76). He was a Homi Bhaba Fellow and visiting Professor at the IIM Calcutta (1967–77) and Senior Lecturer, Economic Development Institute, World Bank, Washington D.C. He has also been Urban Management Adviser to the World Bank (1980–82) and led the World Bank's first urban mission to Shanghai. He lectures frequently in renowned American Universities like Princeton. Harvard, MIT and Yale. Mr. Sivaramakrishnan is also the author of several well-known books on urban management in India and Asia.

**Tom Stoel** a lawyer with the Natural Resources Defence Council (NRDC) in Washington DC, is also director of its international programme. NRDC was started in 1970 and has about 75,000 members in the US. NRDC's role in the US is to engage in environmental advocacy mainly at the national level, to influence US government policies by lobbying US Congressmen, bringing law suits against official agencies, and working closely with other US environmental groups. NRDC works on a variety of US environmental issues including air and water pollution, control of toxic substances, control of hazardous wastes (which is a major problem), pesticides, forestry, agriculture issues, offshore drilling and energy conservation.

NRDC also works on global issues like the depletion of the ozone layer, and the greenhouse effect. NRDC has a fellowship programme in which each year two NGO environmental leaders from a developing country are brought for a month or six weeks to do whatever they like in the US by way of learning or co-operating with US groups in research.